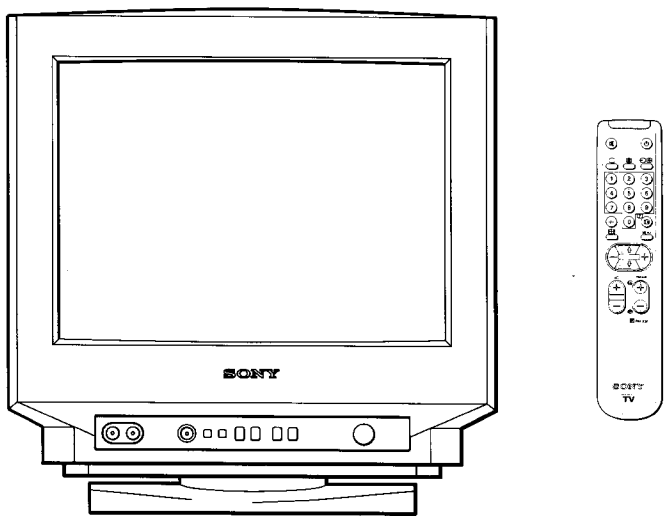
SERVICE MANUAL

BE-4 CHASSIS

MODEL	COMMANDER	DEST.	CHASSIS NO.
KV-14M1A	RM-836	Italian	SCC-H64G-A
KV-14T1A	RM-836	Italian	SCC-H64F-A
KV-14M1B	RM-836	French	SCC-H65F-A
KV-14T1B	RM-836	French	SCC-H65E-A
KV-14M1D	RM-836	AEP	SCC-H46G-A
KV-14T1D	RM-836	AEP	SCC-H46F-A
KV-14M1E	RM-836	Spanish	SCC-H66F-A
KV-14T1E	RM-836	Spanish	SCC-H66E-A
KV-14M1K	RM-836	OIRT	SCC-H52H-A
KV-14T1K	RM-836	OIRT	SCC-H52F-A
KV-14M1L	RM-836	Irish	SCC-H51D-A
KV-14T1L	RM-836	Irish	SCC-H51C-A
KV-14T1R	RM-836	OIRT	SCC-H52G-A
KV-14M1U	RM-836	UK	SCC-H50F-A
KV-14T1U	RM-836	UK	SCC-H50E-A



MICROFILM

TRINITRON® COLOR TV

SONY®

ITEM MODEL	Television System	Channel Coverage	Colour System
Italian	B/G/H	VHF: E2-E12, S1-S20, A-H, H1,H2 UHF: E21-E69, S21-S41	PAL
French	B/G/H, L	VHF: E2-E12, S1-S20, F2-F10, B-Q UHF: E21-E69, S21-S41, F21-F69	PAL, SECAM
AEP	B/G/H	VHF: E2-E12, S1-S20 UHF: E21-E69, S21-S41	PAL, SECAM
Spanish	B/G/H	VHF: E2-E12S1-S20 UHF: E21-E69, S21-S41	PAL
OIRT	B/G/H, D/K	B/G/H VHF: E2-E12 UHF: E21-E69 D/K VHF: R01-R12 UHF: R21-R69	PAL, SECAM NTSC3.58/4.43 (video input only)
Irish UK	I	14M1L/14T1L UHF: 21-69 VHF: A-J 14M1U/14T1U UHF: 21-69	PAL

MODEL	14M1A 14T1A	14M1B 14T1B	14M1D 14T1D	14M1E 14T1E	14M1K 14T1K	14M1L/14T1L 14M1U/14T1U	14T1R
Power Consumption	39W	39W	39W	39W	39W	50W	39W

SPECIFICATIONS

Picture Tube — Super Trinitron
Approx. 37 cm (14 inches)
(Approx. 34 cm picture measured diagonally)
110° -deflection

Rear/Front Terminals

[INPUTS]

21-pin Euro connector (CENELEC standard)
- Including audio / video input
- Including RGB input

Front connectors
Video (phono jack)
Audio (phono jack)

[OUTPUTS]

Headphone jack: minijack

Sound output — 3W (music power)
2W (RMS)

Dimensions — With tilt-swivel
373x385x408 mm approx.
Without tilt-swivel
373x360x408 mm approx.

Weight — Approx. 10.0 kg

Supplied accessories — RM-836 Remote Commander (1)
IEC designated batteries (2)
Tilt-swivel stand (1)
Antenna (1)

Other features
Teletext/Fastext (KV-14T1A/14T1B/14T1D/14T1E)
Teletext (KV-14T1K/14T1L/14T1R/14T1U)

[RM-836]

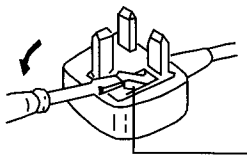
Remote control system	Infrared control
Power requirements	3V dc (2 batteries) R6 (size AA)
Dimensions	Approx. 210x45x24 mm (w/h/d)
Weight	Approx. 90g (Not including battery)

Design and specifications are subject to change without notice.

Item \ Model name	KV-14M1A KV-14T1A	KV-14M1B KV-14T1B	KV-14M1D KV-14T1D	KV-14M1E KV-14T1E	KV-14M1K KV-14T1K	KV-14T1R	KV-14M1L KV-14T1L KV-14M1U KV-14T1U
MPIP	OFF	OFF	OFF	OFF	OFF	OFF	OFF
PIP	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Scart 1	ON	ON	ON	ON	ON	ON	ON
Scart 2	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Front in (3)	ON	ON	ON	ON	ON	ON	ON
Scart 4	OFF	OFF	OFF	OFF	OFF	OFF	OFF
AKB in 16:9 mode	ON	ON	ON	ON	ON	ON	ON
Txt/FLOF	ON (14T1A only)	ON (14T1B only)	ON (14T1D only)	ON (14T1E only)	ON (14T1K only)	ON	ON (14T1L/14T1U only)
TOPText	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Norm B/G/H	ON	ON	ON	ON	ON	ON	OFF
Norm I	OFF	OFF	OFF	OFF	OFF	OFF	ON
Norm D/K	OFF	OFF	OFF	OFF	ON	ON	OFF
Norm AUS	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Norm L	OFF	ON	OFF	OFF	OFF	OFF	OFF
Norm SAT	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Norm M	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Language Preset	Italian	French	German	Spanish	OIRT	OIRT	English

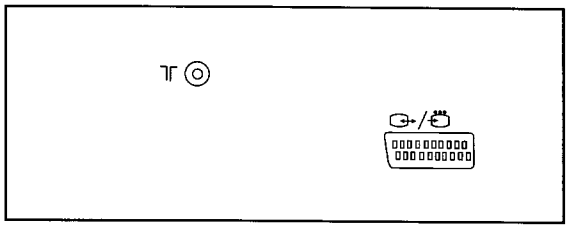
WARNING (KV-14M1L/14T1L/14M1U/14T1U only)

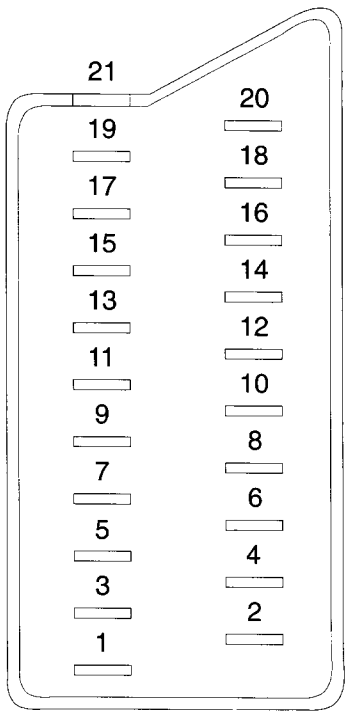
The flexible mains lead is supplied connected to a **B.S. 1363** fused plug having a fuse of **5 AMP** capacity. Should the fuse need to be replaced, use a **5 AMP FUSE** approved by **ASTA** to **BS 1362**, ie one that carries the ASTA mark.
IF THE PLUG SUPPLIED WITH THIS APPLIANCE IS NOT SUITABLE FOR YOUR SOCKET OUTLETS IN YOUR HOME.
IT SHOULD BE CUT OFF AND AN APPROPRIATE PLUG FITTED.
THE PLUG SEVERED FROM THE MAINS LEAD MUST BE DESTROYED AS A PLUG WITH BARED WIRES IS DANGEROUS IF ENGAGED IN A LIVE SOCKET OUTLET.
When an alternative type of plug is used it should be fitted with a **5 AMP FUSE**, otherwise the circuit should be protected by a **5 AMP FUSE** at the distribution board.



How to replace the fuse.
Open the fuse compartment with the screwdriver blade and replace the fuse.

21 pin connector (1)





Pin No.	1	2	4	Signal	Signal Level
1	○	○	○	Audio output B (Right)	Standard level : 0.5V rms Output impedance : Less than 1k ohms*
2	○	○	○	Audio input B (Right)	Standard level : 0.5V rms Output impedance : More than 10k ohms*
3	○	○	○	Audio output A (Left)	Standard level : 0.5V rms Output impedance : Less than 1k ohm*
4	○	○	○	Ground (Audio)	
5	○	○	○	Ground (Blue)	
6	○	○	○	Audio input A (Left)	Standard level : 0.5V rms Output impedance : Less than 10k ohm*
7	○	●	●	Blue input	0.7 ± 3dB, 75 ohms, positive
8	○	○	○	Function select (AV control)	High state (9.5 - 12V) : Part mode Low state (0 - 2V) : TV mode Input impedance : More10k ohms Input capacitance : Less than 2nF
9	○	○	○	Ground (Green)	
10	○	○	○	Open	
11	○	●	●	Green	
12	○	○	○	Open	
13	○	○	○	Ground (Red)	
14	○	○	○	Ground (Blanking)	
15	○	—	—	Red input	0.7 ± 3dB, 75 ohms, positive
	—	○	○	(S signal) croma input	0.7 ± 3dB, 75 ohms, positive
16	○	●	●	Blanking input (Ys signal)	High state (1 - 3V) Low state (0 - 0.4V) Input impedance : 75 ohms
17	○	○	○	Ground (Video output)	
18	○	○	○	Ground (Video input)	
19	○	○	○	Video output	1V ± 3dB, 75ohms, positive sync : 0.3V (-3 + 10dB)
20	○	—	—	Video input	1V ± 3dB, 75ohms, positive sync : 0.3V (-3 + 10dB)
	—	○	○	Video input Y (S signal)	1V ± 3dB, 75ohms, positive sync : 0.3V (-3 + 10dB)
21	○	○	○	Common ground (plug, sheild)	

○ Connected ● Not Connected (Open) * at 20Hz - 20kHz

Pin No.	Signal	Signal Level
1	Ground	
2	Ground	
3	Y (S signal) input	1V ± 3dB 75 ohm, positive Sync. 0.3V -3 + 10dB
4	C (S signal) input	0.3V ± 3dB 75ohm, positive Sync.

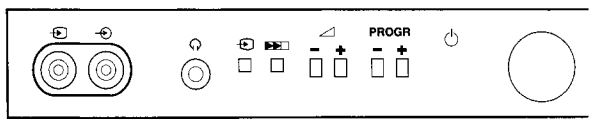


TABLE OF CONTENTS

Section	Title	Page
1. GENERAL		
	Getting Started	7
	TV Operation	8
	MENU Operation	9
	Optional Connections	12
	Additional Information	13
2. DISASSEMBLY		
2-1.	Rear Cover Removal	14
2-2.	Service Position	14
2-3.	Picture Tube Removal	15
3. SET-UP ADJUSTMENTS		
3-1.	Beam Landing	16
3-2.	Convergence	17
3-3.	Screen (G2), Drive, White Balance, Sub Color and Sub Brightness	19
3-4.	Focus	19
4. CIRCUIT ADJUSTMENTS		
4-1.	Electrical Adjustments	20
4-2.	Test Mode 2 :	21
4-3.	BE-4 Self Diagnostic Software	23
5. DIAGRAMS		
5-1.	Block Diagrams	25
5-2.	Circuit Boards Location	29
5-3.	Schematic Diagrams and Printed Wiring Boards	29
	*A Board	33
	*C Board	39
5-4.	Semiconductors	41
6. EXPLODED VIEWS		
6-1.	Chassis and Picture Tube	42
7. ELECTRICAL PARTS LIST		44

CAUTION

SHORT CIRCUIT THE ANODE OF THE PICTURE TUBE AND THE ANODE CAP TO THE METAL CHASSIS, CRT SHIELD, OR CARBON PAINTED ON THE CRT, AFTER REMOVING THE ANODE.

ATTENTION

APRES AVOIR DECONNECTE LE CAP DE L'ANODE, COURT-CIRCUITER L'ANODE DU TUBE CATHODIQUE ET CELUI DE L'ANODE DU CAP AU CHASSIS METALLIQUE DE L'APPAREIL, OU AU COUCHE DE CARBONE PEINTE SUR LE TUBE CATHODIQUE OU AU BLINDAGE DU TUBE CATHODIQUE.

WARNING !!

AN ISOLATION TRANSFORMER SHOULD BE USED DURING ANY SERVICE TO AVOID POSSIBLE SHOCK HAZARD, BECAUSE OF LIVE CHASSIS.
THE CHASSIS OF THIS RECEIVER IS DIRECTLY CONNECTED TO THE AC POWER LINE.

ATTENTION !!

AFIN D'EVITER TOUT RISQUE D'ELECTROCUTION PROVENANT D'UN CHÁSSIS SOUS TENSION, UN TRANSFORMATEUR D'ISOLEMENT DOIT ETRE UTILISÉ LORS DE TOUT DÉPANNAGE.
LE CHÁSSIS DE CE RÉCEPTEUR EST DIRECTEMENT RACCORDÉ À L'ALIMENTATION SECTEUR.

SAFETY-RELATED COMPONENT WARNING!!

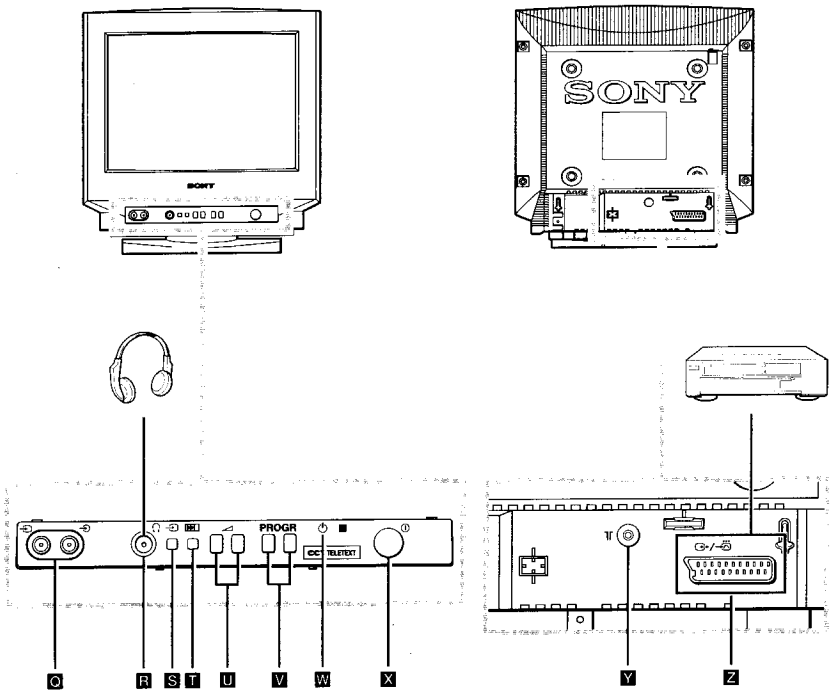
COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND, IN THE PARTS LIST ARE CRITICAL FOR SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

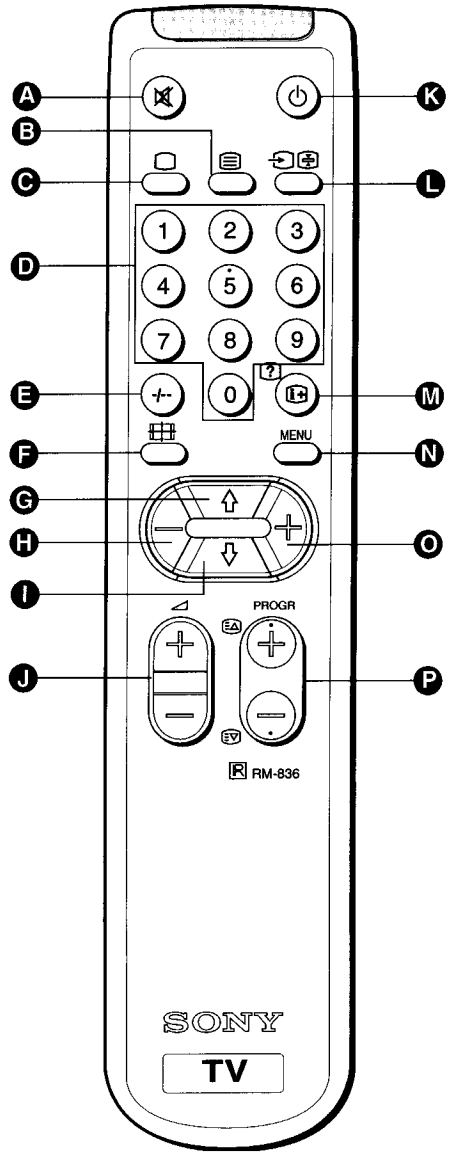
ATTENTION AUX COMPOSANTS RELATIFS À LA SÉCURITÉ!!

LES COMPOSANTS IDENTIFIÈS PAR UNE TRAME ET PAR UNE MARQUE ⚠ SUR LES VUES EXPLOSÉES ET LES LISTES DE PIECES SONT D'UNE IMPORTANCE CRITIQUE PUR LA SÉCURITÉ DU FONCTIONNEMENT. NE LES REMPLACER QUE PAR DES COMPOSANTS SONY DONT LE NUMÉRO DE PIÉCE EST INDIQUÉ DANS LE PRÉSENT MANUEL OU DANS DES SUPPLÉMENTS PUBLIÉS PAR SONY.

SECTION 1 GENERAL

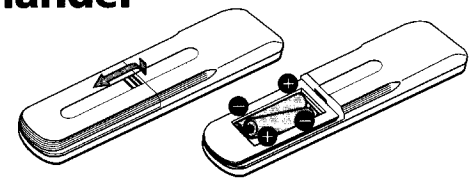
The operating instructions mentioned here are partial abstracts from the Operating Instruction Manual. The page numbers of the Operating Instruction Manual remain as in the manual.





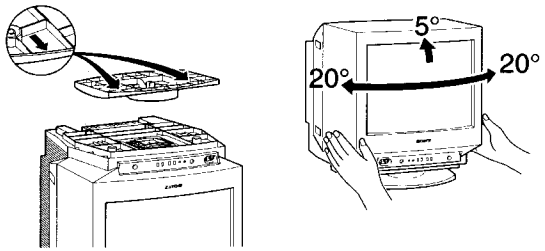
Step 1

Inserting the Batteries into the Remote Commander



Step 2

Installing the Tilt-Swivel



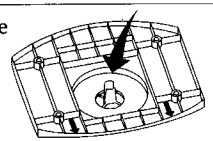
1 Turn the TV upside down onto a soft base.

2 Check that the arrows point forward and clip the swivel to the base of the TV.

3 Turn the TV again.

4 Use the tilt-swivel to bring the TV into the optimum viewing position.

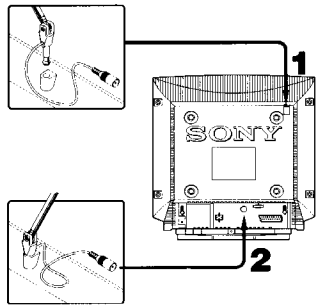
Note • To remove the tilt-swivel, check that the arrows are pointing forward, pinch the clip of the swivel and pull away from the base of the TV.



Step 3

Connecting the Aerial

If you connect a VCR, skip to step 4.



Connect an external aerial to the socket Y.
Where an external aerial is not available connect the indoor aerial supplied:

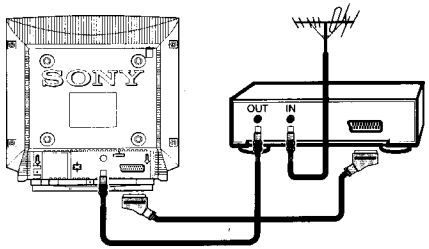
1 Insert the supplied aerial into the opening on top of the set.

2 Connect the aerial to the socket Y on the rear of the set.

3 Adjust the aerial for optimum reception.

Step 4

Connecting a VCR



- It is recommended to tune in the VCR signal to programme number "0". For details, see "Presetting Channels Manually" on page 13.

Step 5

Presetting Channels Automatically

TV searches for all available channels. If manual tuning is preferred see Menu option - Presetting Channels Manually.

1 Plug into mains.
Depress power switch ⏻ X on TV set.

2 Press and hold ⏭ T on TV set until auto tuning starts and screen shows.



Note • When Auto tuning stops the programme on position 1 is seen.

TV Operation

This section explains functions used whilst watching TV. Most operations are carried out using the Remote Commander.

To	Press
Switch on	⏻ X on TV
Switch off temporarily	⏻ J *TV is now in standby mode, ⏻ indicator W on TV lights.*
Switch on again	▢ C, PROGR +/- P V or any number button D
Switch off completely	⏻ X on TV *To save energy we recommend switching off completely when TV is not in use.*
Select programmes	PROGR +/- P V or number buttons D *For double digit numbers press -/-- E then the number e.g. For 23, press -/-- E then 2 and 3.*
Display the programme number	⊡ L *Press again to make programme number disappear.*
Adjust the volume	◿+/- I U
Mute the sound	🔇 A *Press again to restore sound.*
View video input	⏎ K S *Press again to return to TV programme.*
View programmes in 16:9 mode	▭ F *Press again to return to 4:3 mode.* **Note** • ▭ F is to be used to optimise the viewing of 16:9 signals which will be available in the future.

Viewing Teletext

Teletext is an information service broadcast by TV stations.

1 Select the channel which carries the teletext service you wish to receive.

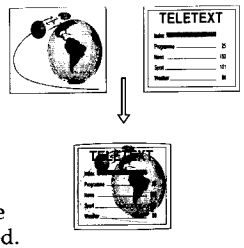
2 Press ▤ Ⓑ to switch on teletext.

3 Input three digits for the page number using the programme number buttons Ⓓ or PROGR +/- ⓅⓋ.

4 Press ▢ Ⓒ to switch off teletext.

Note • Teletext errors may occur if the broadcasting signals are weak.

Using Other Teletext Functions



Superimposing teletext on the TV

Press ▤ Ⓑ once in teletext mode or twice in TV mode to superimpose teletext on the TV screen.
Press ▤ Ⓑ again to cancel superimposing.

Freezing a teletext subpage

Press ⊕ Ⓚ (HOLD) to freeze the subpage. Freezing the page prevents the information that is displayed from being updated.
Press ⊕ Ⓚ to cancel HOLD and allow update to continue.

Revealing concealed information (eg: answers to a quiz)

Press ? Ⓛ to reveal information.
Press again to conceal the information.

Using colour buttons to access pages

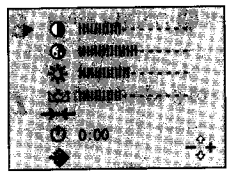
When the colour coded menu appears at the bottom of a page, press the colour button (red, green, blue or yellow) ⒼⒽⓄⓃ to access the corresponding page.

Note • A programme status message in a blue box may appear when you change programmes (depends on broadcasters).

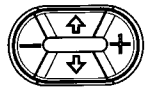
Use buttons on Remote Commander to control Menu screen.

MENU Ⓜ
Menu Screen on/off

Green Ⓖ
scroll up



Red Ⓗ
decrease



Yellow Ⓝ
increase/confirm(OK)

Blue Ⓞ
scroll down

Adjusting the Picture

1 Press MENU Ⓜ.

2 Press green Ⓖ or blue Ⓞ button to select the item you wish to change.

Symbol	Item	- Effect	+
◑	Picture	Less	More
◕	Colour	Less	More
☼	Brightness	Darker	Brighter
⊿	Hue	Reddish	Greenish

Note • Hue is available only when NTSC signal is input.

3 Press red Ⓗ or yellow Ⓝ button to change levels.

4 Press MENU Ⓜ to return to normal TV screen.

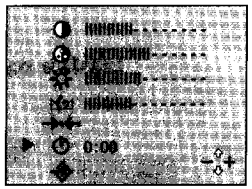
Note • To reset to factory preset picture levels, press green Ⓖ or blue Ⓞ button to select →•← and press yellow (OK) Ⓝ button.

Using the Sleep Timer

The TV may be set to switch to the standby mode automatically after a length of time chosen by you. You may set the time in 30 minutes steps up to 4 hours.

1 Press MENU Ⓜ.

2 Press green Ⓖ or blue Ⓞ button to select ⏻.



3 Press red Ⓗ or yellow Ⓝ button to set time delay.
0.00 (OFF) 0.30 1.00 1.30 .... 4.00

4 Press MENU Ⓜ to return to normal TV screen.
When watching TV, press ⓘ Ⓛ to display time remaining.

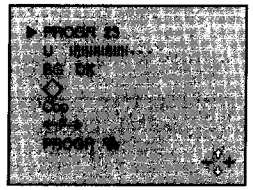
Presetting Channels Manually

Up to 60 programme positions are available for presetting channels.

1 Press MENU Ⓜ.

2 Press green Ⓖ or blue Ⓞ button to select ⇨ and press yellow (OK) Ⓝ button.

3 Select programme number using PROGR +/- ⓅⓋ or the number buttons Ⓓ.



4 Press green Ⓖ or blue Ⓞ button to select TV system (BG or DK) if necessary and press red Ⓗ or yellow Ⓝ button to change TV system.

5 Press green Ⓖ or blue Ⓞ button to select tuning bar (||||||····) and press red Ⓗ or yellow Ⓝ button to start channel search. When a channel is found the tuning bar stops moving and you see the picture.

6 If you want to store, press green Ⓖ or blue Ⓞ button to select ◇ and press yellow (OK) Ⓝ button. If you do not want to store, press red Ⓗ or yellow Ⓝ button to continue search.

7 Repeat steps 3 to 6 for all other channels.

8 Press MENU Ⓜ to return to normal TV screen.

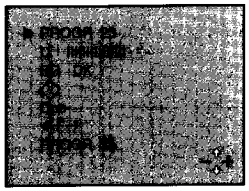
Skipping Programme Positions

You can skip unused programme positions when selecting channels with the PROGR +/- P V buttons. You can still select them, however, using the number buttons D.

1 Press MENU M.

2 Press green G or blue O button to select ⇨ and press yellow N button.

3 Select programme number you want to skip using PROGR +/- P V button or number buttons D.



4 Press green G or blue O button to select Coo and press yellow (OK) N button.

5 Press green G or blue O button to select ◇ and press yellow (OK) N button to store.

6 Repeat steps 3 to 5 for other unused programme positions.

7 Press MENU M to return to normal TV screen.

Fine-Tuning Channels

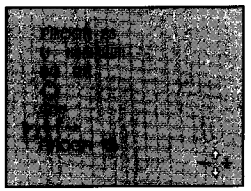
You can fine tune a stored channel if necessary.

1 Select the channel you wish to fine tune.

2 Press MENU M.

3 Press green G or blue O button to select ⇨ and press yellow (OK) N button.

4 Press green G or blue O button to select ←F→ and use red H or yellow N button to adjust tuning.



5 Press green G or blue O button to select ◇ and press yellow (OK) N button to store.

6 Press MENU M to return to normal TV screen.

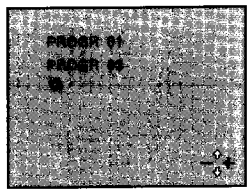
Exchanging Programme Positions

After tuning you may wish to rearrange the programme positions.

1 Press MENU Ⓜ.

2 Press green Ⓖ or blue Ⓞ button to select ⇨ and press yellow (OK) Ⓝ button.

3 Press green Ⓖ or blue Ⓞ button to select PROGR and press yellow (OK) Ⓝ button.



4 Press red Ⓗ or yellow Ⓝ button to select the first programme position.

5 Press the blue Ⓞ button.

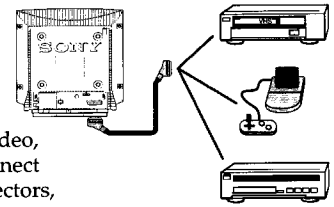
6 Press the red Ⓗ or yellow Ⓝ button to select the second programme position.

7 Press blue Ⓘ button to select and press yellow (OK) Ⓝ button to exchange.

8 Repeat steps 4 to 7 for other programme positions.

9 Press MENU Ⓜ to return to normal TV screen.

Using the Connectors



Your TV has one 21-pin connector Ⓩ on the rear of the set and two connectors (phono jacks ⇨ video, ⇨ audio) Ⓠ on the front of the set. You can connect optional audio or video equipment to these connectors, such as a VCR, video games or a video disc player.

1 Press ⇨ ⓀⓈ to view the video input signal.

2 Press ⇨ ⓀⓈ or ▢ Ⓒ to return to the normal TV screen.

Note • To avoid picture distortion, do not use the 21-pin connector and the front connectors at the same time.

Connecting Headphones

Plug in the headphones to the ∩ Ⓡ socket on the front of the TV set, to mute the sound from the speaker.

Troubleshooting

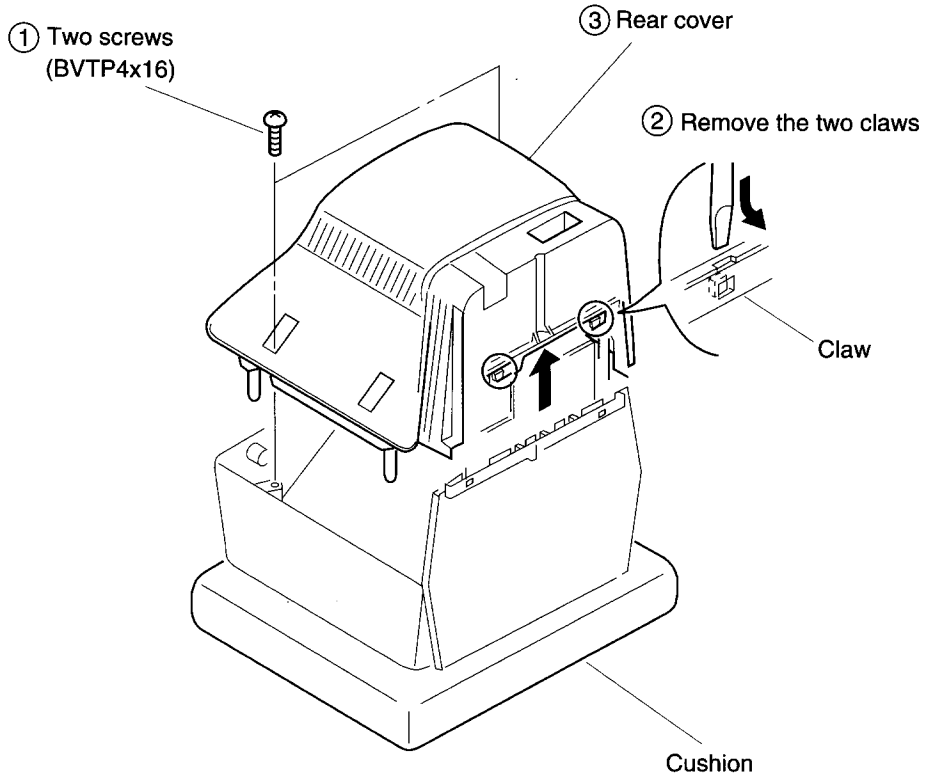
Here are some simple solutions to the problems which affect the picture and sound.

Problem	Solution
No picture, screen is dark, no sound	• Plug the TV in. • Press ⏻ X on the TV. • Press ▢ C or the programme number D on the remote commander if ⏻ indicator W is on. • Check the aerial connection. • Check that the video source is on. • Turn the TV off for 3 or 4 seconds and then turn it on again using ⏻ X.
Poor or no picture (screen is dark, sound is good)	• Press MENU M and adjust brightness picture and colour levels.
Good picture, no sound	• Adjust the volume ◿ +/– I U . • Disconnect any headphones. • Press 🔇 A if 🔇 is displayed on the screen. • Press MENU M and select appropriate TV system.
No colour on colour programmes	• Press MENU M and adjust colour balance. • Press MENU M and reset to factory settings.
Distorted picture when you change programmes or select teletext	• Turn off the equipment connected to the 21-pin connector Z.
Partially discoloured picture when you swivel the TV	• Turn off the TV for fifteen minutes using the power switch ⏻ X on TV set then turn on again.
Remote commander does not function	• Replace the batteries.

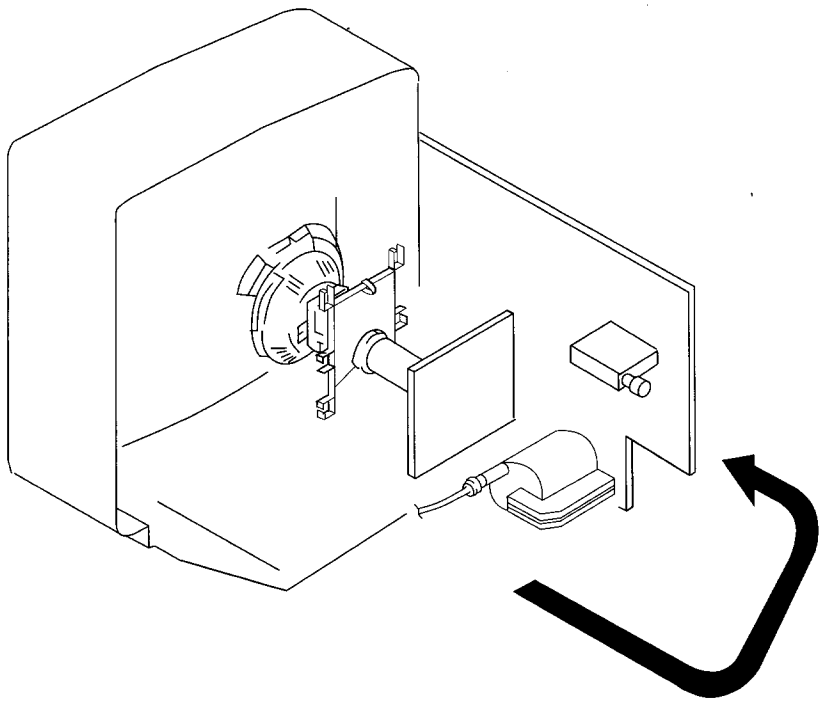
- **If you continue to have these problems, have your TV serviced by qualified personnel.**
- **NEVER open the casing yourself.**

SECTION 2
DISASSEMBLY

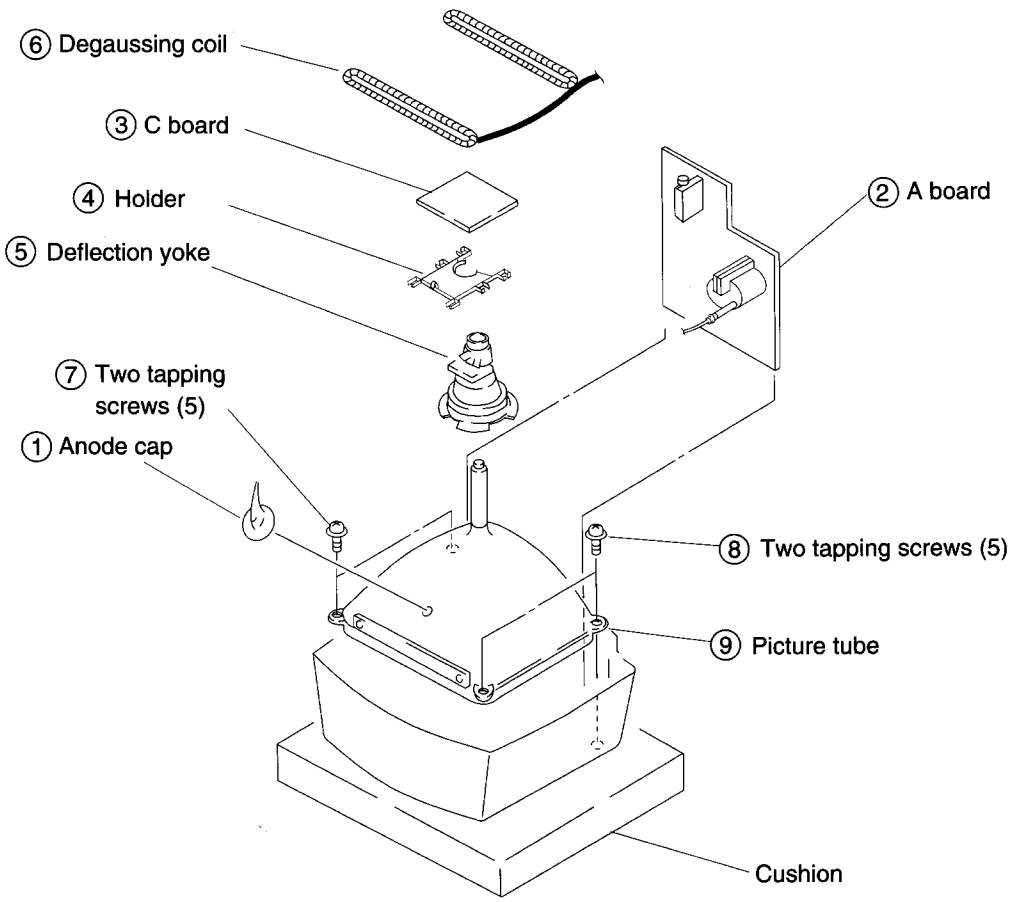
2-1. REAR COVER REMOVAL



2-2. SERVICE POSITION



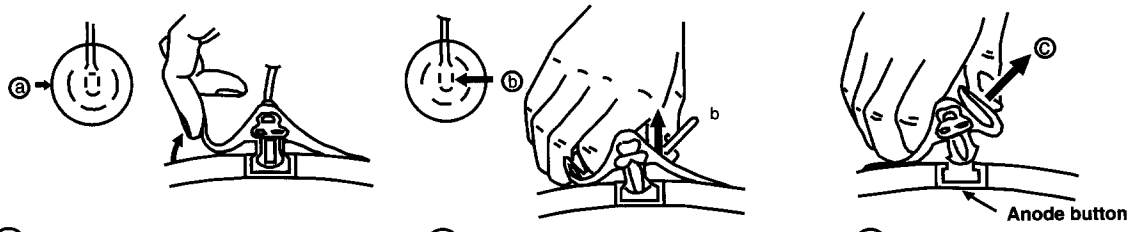
2-3. PICTURE TUBE REMOVAL



• REMOVAL OF ANODE-CAP

Note: Short circuit the anode of the picture tube and the anode cap to the metal chassis, CRT shield or carbon paint on the CRT, after removing the anode.

*** REMOVING PROCEDURES.**



① Turn up one side of the rubber cap in the direction indicated by the arrow ⓐ

② Using a thumb pull up the rubber cap firmly in the direction indicated by the arrow ⓑ

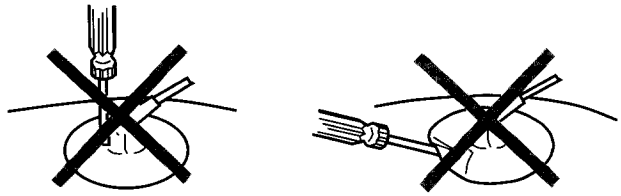
③ When one side of the rubber cap is separated from the anode button, the anode-cap can be removed by turning up the rubber cap and pulling it up in the direction of the arrow ©

• HOW TO HANDLE AN ANODE-CAP

① Don't damage the surface of anode-cap with sharp shaped material !

② Don't press the rubber hardly not to hurt inside of anode-caps !
A metal fitting called as shatter-hook terminal is built into the rubber.

③ Don't turn the foot of rubber over hardly !
The shatter-hook terminal will stick out or damage the rubber.



SECTION 3
SET-UP ADJUSTMENTS

- The following adjustments should be made when a complete realignment is required or a new picture tube is installed.
- These adjustments should be performed with the rated power supply voltage, unless otherwise noted.

The Contrast and Brightness controls should be set as follows unless otherwise noted:

◑ CONTRAST control 80%
(or Normal by commander)
☼ BRIGHTNESS control 50%

Perform the adjustments in the following order:
1. Beam Landing
2. Convergence
3. Screen (G2), Drive, White Balance, Sub Color and Sub Brightness.
4. Focus

Note: Test Equipment Required.
1. Color bar/Pattern Generator
2. Degausser
3. DC Power Supply
4. Digital multimeter
5. Oscilloscope

Preparation:
- In order to reduce the influence of external magnetic forces on the picture tube, face the TV set in an easterly or westerly direction.
- Turn the power switch for the unit ON and erase the magnetic force using a degausser.

3-1. BEAM LANDING

Demagnetize with a degausser.
1. Input an all white raster signal from the pattern generator.
   CONTRAST } normal
   BRIGHTNESS }
2. Switch the raster signal of the pattern generator to Red.
3. Move the deflection yoke backward, and adjust with the purity control so that Red is at the center and the Blue and Green are evenly spaced at the sides. see (Fig. 3-1 - 3-3)
4. Move the deflection yoke forward, and adjust so that the entire screen becomes Red. (Fig. 3-1)
5. Switch the raster signal to Blue and then Green to confirm the condition.
6. When the position of the deflection yoke has been determined, tighten it with the deflection yoke mounting screw.
7. When the landing at the corners is not correct, adjust by using disk magnets. (Fig. 3-4)

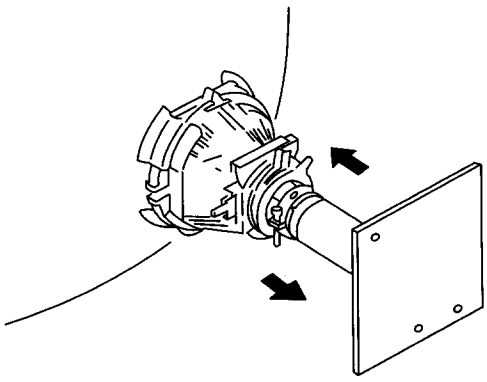


Fig. 3-1

Fig. 3-2

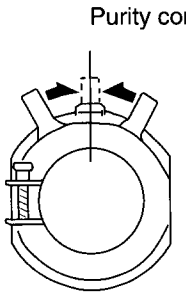


Fig. 3-3

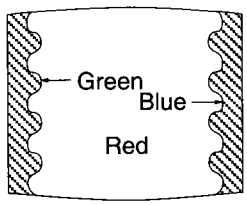
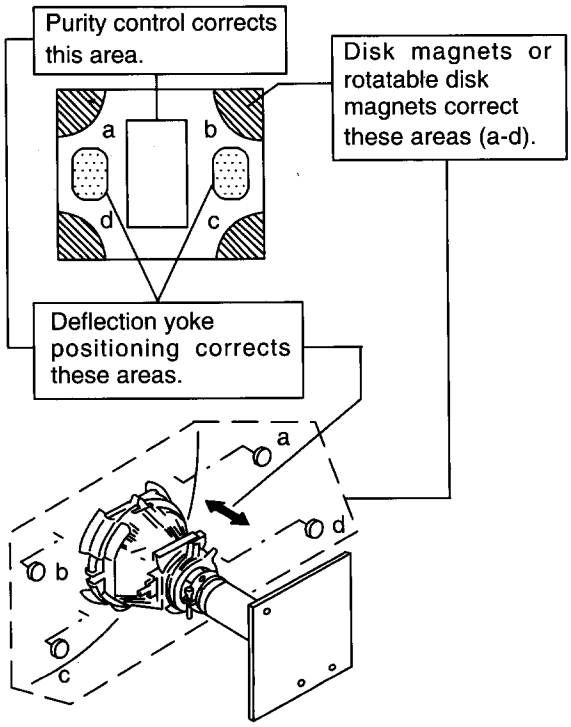


Fig. 3-4

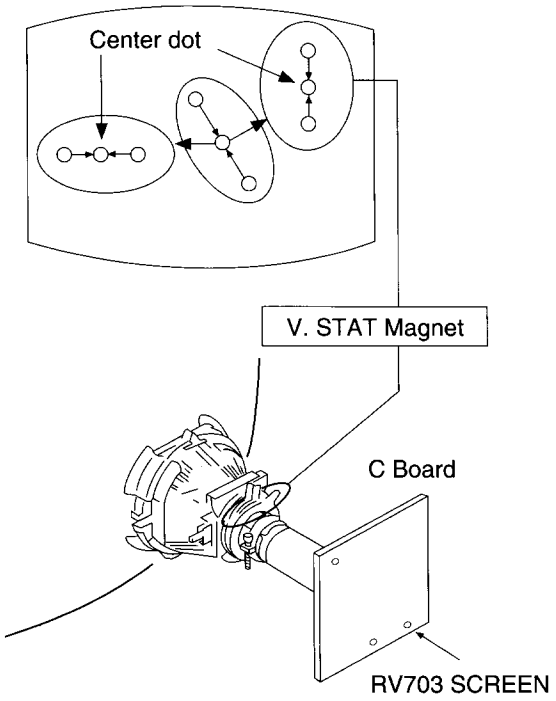


3-2. CONVERGENCE

Preparation:

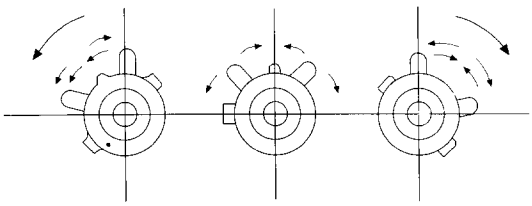
- Before starting, perform FOCUS, H.SIZE, and V.SIZE adjustments.
- Set the BRIGHTNESS control to minimum.
- Input a dot pattern from the pattern generator.

(1) Horizontal and Vertical Static Convergence

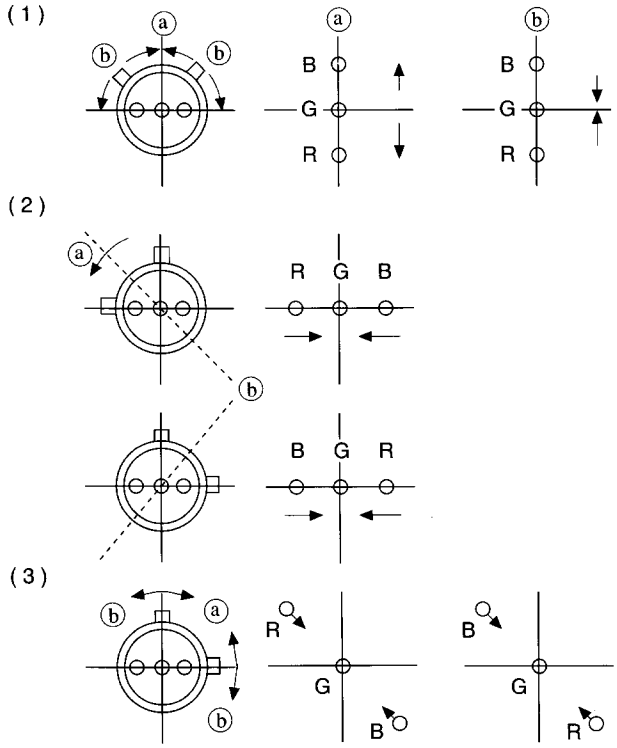


1. Adjust the V.STAT magnet to converge the Red, Green and Blue dots at the center of the screen. (Vertical and Horizontal movement)

- Tilt the V.STAT magnet and adjust the static convergence by opening or closing the V.STAT magnet.



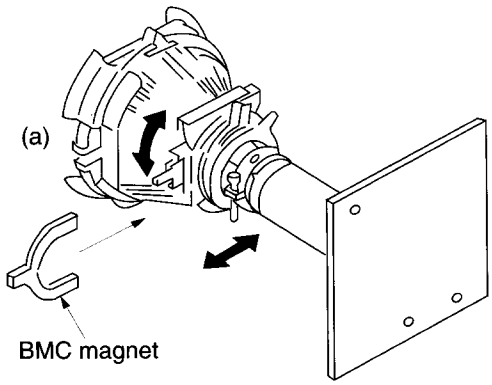
2. When the V.STAT magnet is moved in the direction of the (a) and (b) arrows, the Red, Green and Blue dots move as shown below.



If the Red and Blue dots do not converge with the Green dots, perform the following steps.

1. Move the BMC magnet (a) to correct for insufficient H.static convergence.
2. Rotate the BMC magnet (b) to correct for insufficient V.static convergence.

In either case, repeat the Beam Landing Adjustment.

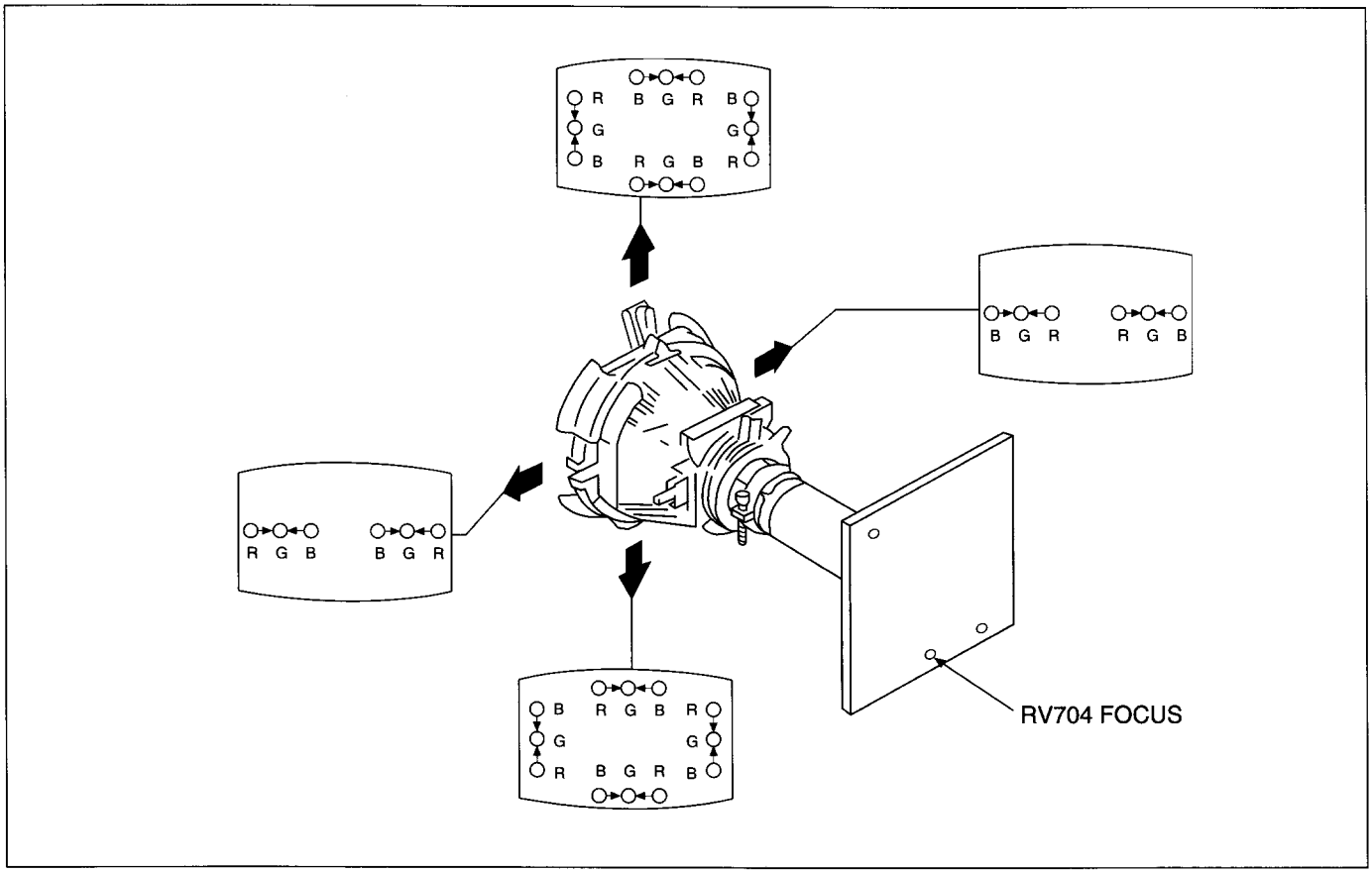


(2) Dynamic Convergence Adjustment

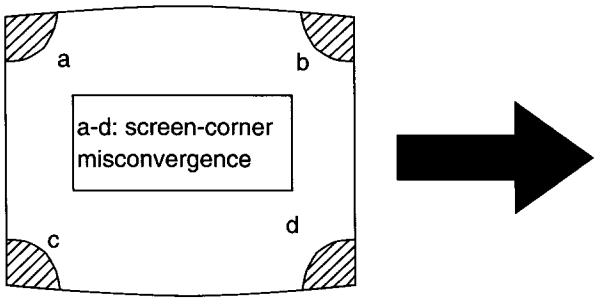
Preparation:

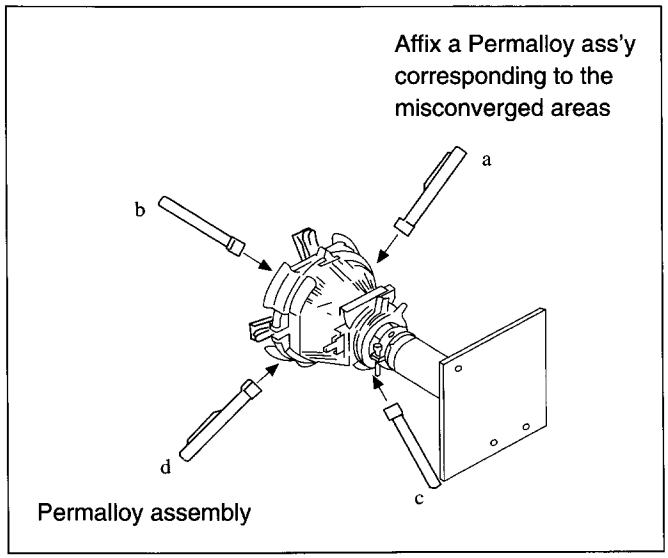
- Before starting to perform the Horizontal and Vertical static convergence adjustment.

1. Slightly loosen the deflection yoke screw.
2. Remove the deflection yoke spacers.
3. Move the deflection yoke for best convergence as shown below.
4. Tighten the deflection yoke screw.
5. Install the deflection yoke spacers.

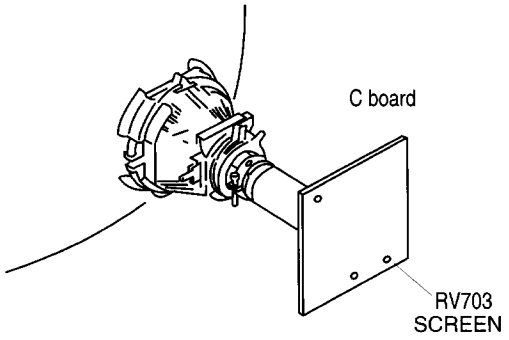


(3) Screen-corner Convergence.





3-3. SCREEN (G2), DRIVE, WHITE BALANCE, SUB COLOR and SUB BRIGHTNESS.

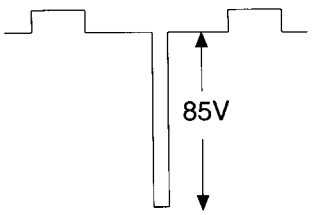


Screen (G2) setting

1. Input a 0 IRE (Black Level) signal from the pattern generator.
2. Enter into the Service Mode "Test""Test" and 38.
3. Adjust RV703 until the Down arrow is displayed.
4. Adjust RV703 until the Down arrow just disappears.
5. Press the TV Button on the Remote Commander to store the data.

Drive Level

1. Input a Video signal containing a small area of 100% white on a black background.
2. Connect an oscilloscope to Pin (7) of J701 (R OUT) on the C Board.
3. Set the Picture to maximum using "Test""Test" and 01.
4. Enter into the Service mode (Adjust Menu).
5. Using the Blue and Green buttons select "RED HWB".
6. Using the Red and Yellow buttons on the Remote Commander adjust until the oscilloscope waveform has an amplitude of 85V.

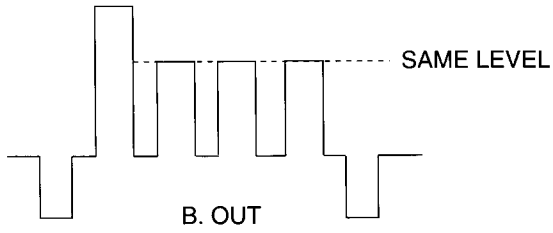


White Balance Adjustment

1. Input an all white pattern from the pattern generator.
2. Adjust the Color and Brightness controls to the standard level.
3. Enter into the Service Mode.
4. Adjust the Green HWB and Blue HWB so that the White Balance becomes optimum.

Sub Color Adjustment

1. Input a PAL color bar pattern from the pattern generator.
2. Connect an oscilloscope to Pin (5) of J701 (B OUT) on the C Board.
3. Enter into the Service Mode "Test""Test" and 22.
4. Using the Red and Yellow buttons on the Remote Commander adjust until the oscilloscope waveform becomes as follows :



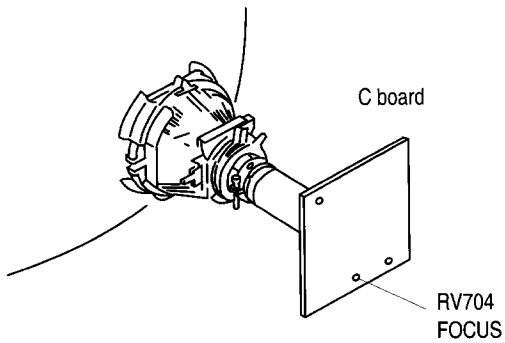
Note : If the TV is able to receive PAL and SECAM transmissions, repeat the above procedure using a Secam color bar signal.

Sub Brightness Adjustment

1. Input a Philips pattern from the pattern generator.
2. Enter into the Service Mode "Test""Test" and 23.
3. Using the Red and Yellow buttons on the Remote Commander adjust until the 0 IRE of the grey scale and the cut off are only slightly visible on the screen.

3-4. FOCUS

Adjust the FOCUS control RV704 so that the whole screen is in best focus.



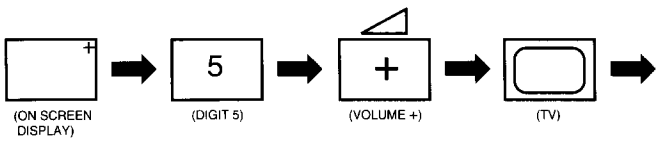
SECTION 4
CIRCUIT ADJUSTMENTS

4-1. ELECTRICAL ADJUSTMENTS

Service adjustment to this model can be performed with the supplied Remote Control Commander RM-836.

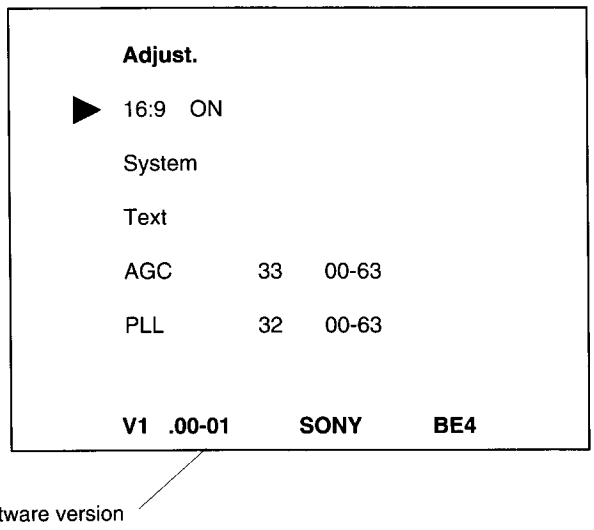
HOW TO ENTER INTO SERVICE MODE

1. Turn on the main power of the set and enter into stand-by mode.
2. Press the following sequence of buttons on the Remote Control Commander.



"TT-- " will appear in the top right corner of the screen Other status information will also be displayed.

3. Press the MENU button on the Remote Commander to obtain the menu on the screen.



4. Press the Blue (Next) or Green (previous) buttons to select the adjustment item from the table.
5. Press the Yellow (+) or Red (-) buttons to change the data as required.
6. Turn off the power to quit the service mode when adjustments are completed.

Range of adjustments available from the on screen menu system.

Adjustment	Set	Range
16:9 Off	Select	ON/OFF
System	Select	BG-L, BG-DK UK, Eire, BG
Text	Select	EAST/WEST
AGC	Adj.	00 - 63
PLL	Adj.	00 - 63
B&W Delay	Adj.	00 - 63
Ver Size	Adj.	00 - 63
Ver, Breath	00	00 - 63
Par, Ampl	00	00 - 63
Par, Tilt	32	00 - 63
V, Linear	Adj.	00 - 63
Corn, corr	00	00 - 63
V, Cen or EW	Adj.	00 - 63
V, Position	42	00 - 63
H, Centre	Adj.	00 - 63
Blue HWB	Adj.	00 - 63
Green HWB	Adj.	00 - 63
Red HWB	Adj.	00 - 63

4-2. TEST MODE 2:

TT -- Mode is available by pressing the Test button twice, O.S.D 'TT --' appears. The functions described below are available by pressing two digits. To release the 'TT --' mode, press 0 twice, press 'TEST' , press 'TV' or switch the TV into Stand-by mode.

00	Switch 'TT--' Mode off.
01	Set picture level to maximum.
02	Set picture level to minimum.
03	Set volume to 35%.
04	Set volume to 50%.
05	Set volume to 65%.
06	Set volume to 80%.
07	Ageing condition (picture max., brightness max.).
08	Shipping condition (Analog values are RESET to factory setting, Prog 1 is selected, TT--mode switched off, Vol = 35%).
09	Dummy.
10	No function.
11	Dummy
12	Text Picture Level Offset (Enable/Disable)
13	Select Odd / Even field for Non-interlaced teletext.
14	Select Interlaced / Non-interlaced teletext display.
15	Read factory setting from ROM to NVM - Reads Volume, Brightness, Picture, Hue, Sharpness and Colour values from ROM to the actual used values (Last Power Memory).
16	No function
17	Enable / Disable Sharpness Operation.
18	Enable / Disable Teletext Operation.
19	Enable / Disable NTSC Operation.
20	No function.
21	Sub Picture.
22	Sub Colour (Pal / Secam Different Stores)
23	Sub Brightness.
24	Destination System BG/L.
25	Destination Systems BG/L.
26	Destination Systems I.
27	Destination System I/I'.
28	Destination BG only.
29	Dummy.
30	No function.
31-32	Dummy.
33	Auto AGC Adjust.
34	Auto PLL Adjust.
35-37	Dummy.
38	Enter G2 adjustment mode.
39	Dummy.
40	No function.
41	Re-initialise NVM.
42	Dummy.
43	Re-initialise Geometry settings.
44-47	Dummy
48	Set NVM testbyte to 44h in NVM.
49	Erase NVM testbyte
50	No function.

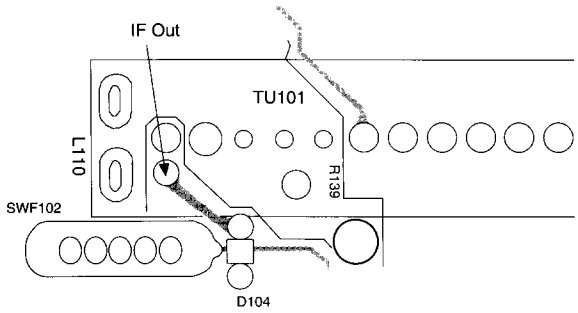
Note : For Test Modes 41 - 50, it is necessary to ensure that the TV is set to Prog 59.

IF ADJUSTMENT (AUTOMATIC)

1. Input a 38.9 MHz 100dBμ CW signal at the IF Out injection point.
2. Enter into service mode and press 34.
3. Connect a digital voltmeter to IC101 pin (23).
4. Check AFT 2.5V ±0.3V dc.
5. Press '00' on the Remote Commander.

SYSTEM L ADJUSTMENT (French Models)

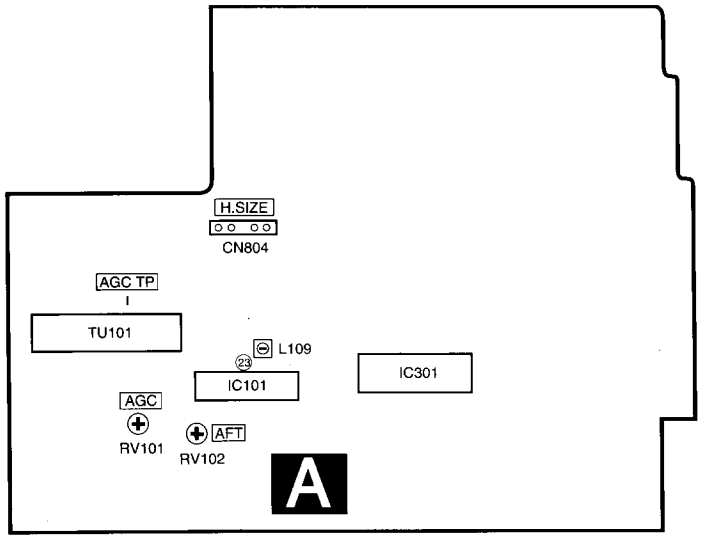
1. Input a 33.9MHz 100dBμ CW signal at the IF Out injection point.
2. From the On Screen Menu set System to L band 1.
3. Connect a digital voltmeter to IC101 pin (23).
4. Adjust RV102 AFT for 2.5V ±0.3V dc.



- A Board Print Side -

AGC ADJUSTMENT

1. Receive an off-air signal.
2. Enter into the Service adjust menu and select AGC.
3. Adjust the data using the Red and Yellow buttons on the Remote Commander so that there is no snow or cross - modulation visible on the screen.
4. Change the receiving off-air channel, and confirm the above status.



- A Board Component Side -

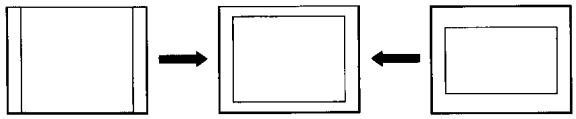
DEFLECTION SYSTEM ADJUSTMENT

1. Enter into the service mode.
2. Using the Blue or Green buttons select the Adjust item.
3. Press the Yellow button to enter the adjustment submenu.
4. Select and adjust each item in order to obtain the optimum image.

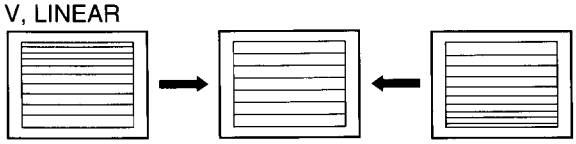
See Note on page 23

Adjustment	Set	Range
VERT, AMPL	Adj.	00 - 63
VER, BREATH	00	00 - 63
PAR, AMPL	00	00 - 63
PAR, TILT	32	00 - 63
V, LINEAR	Adj.	00 - 63
CORN, CORR	Adj.	00 - 63
V, CENTRE	Adj.	00 - 63
V, POSITION	42	00 - 63
H, CENTRE	Adj.	00 - 63

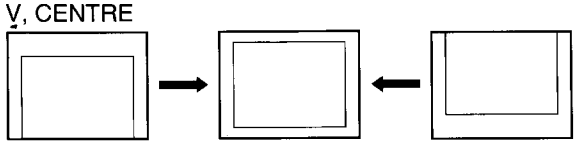
VERT, AMPL



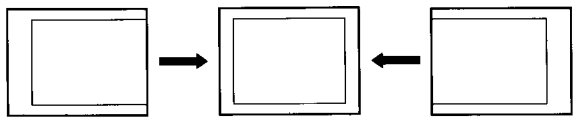
V, LINEAR



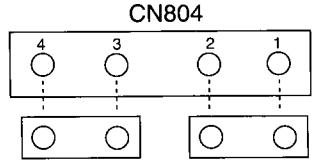
V, CENTRE



H, CENTRE



H, SIZE



Fit the link as required to obtain the correct horizontal picture size. Remove the link if the H, SIZE is to large.

4-3. BE-4 SELF DIAGNOSTIC SOFTWARE

The identification of errors within the BE-4 chassis is triggered in 1 of 2 ways :- 1: Bus busy or 2: Device failure to respond to I^2C. In the event of one of these situations arising the software will first try to release the Bus if busy (Failure to do so will report with a continuous flashing LED) and then communicate with each relevant device in turn to establish if a device is faulty. If a device is found to be faulty the relevant device number will be displayed through the LED by a Series of flashes which must be counted (See Table 1)., on fatal errors are reported with this method.

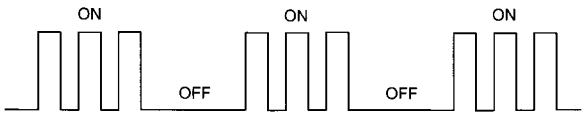
If a fatal error is found, the set will simply stay in whichever state it was when the error occurred, but if a non fatal error occurs the set will try to continue to operate.

Table 1

No of Flashes	Meaning
2	IC301 not acknowledging I^2C transmission, NVM OK.
3	IC301 FAULT (Not OK) - flags
4	IC301 - No H Flyback
5	IC301 - Stack Overflow.
6	Overvoltage / Overcurrent Protection (Pin 52) high.
7	IC002 not acknowledging I^2C transmission, IC301 OK.
8	IC002 and IC301 - No I^2C acknowledgment.
9	General I^2C Error (SDA or SCL being held low) (IC301, IC001, IC002, CN001)

Flash Timing Example : e.g. error number 3

Stby LED

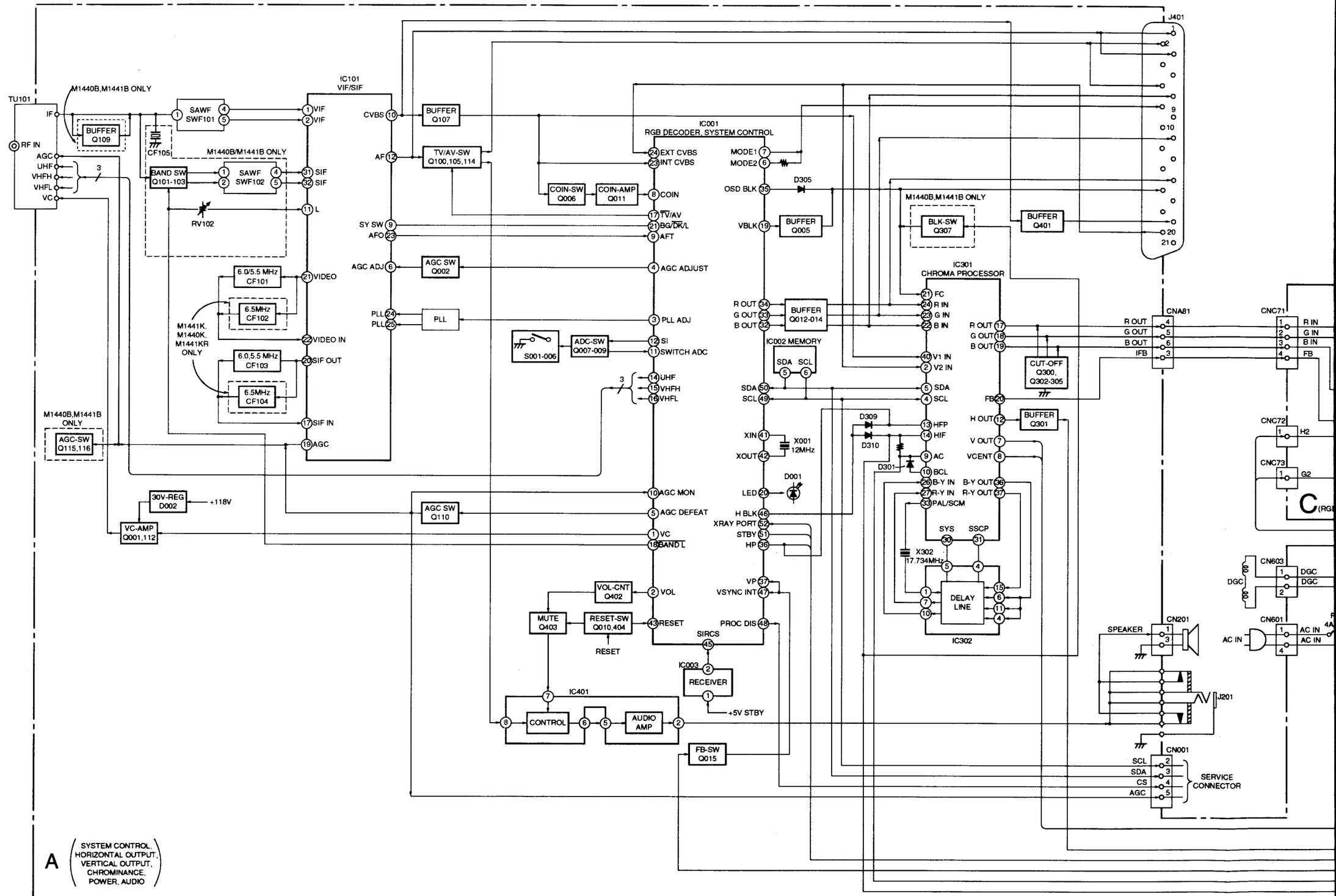


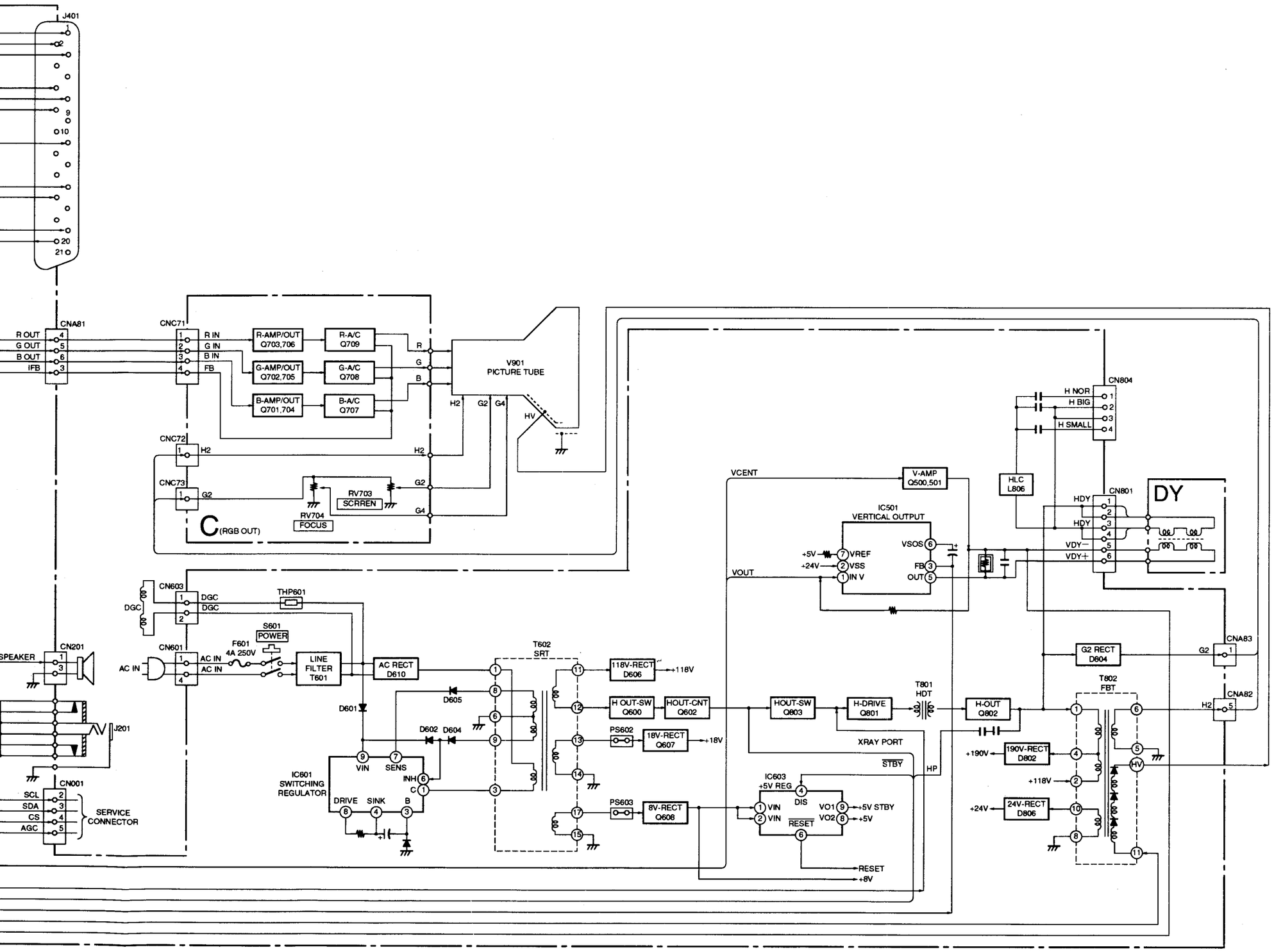
Note : Deflection System Adjustments should not be carried out whilst using an NTSC (60Hz) signal, or if the signal is unlocked.

MEMO

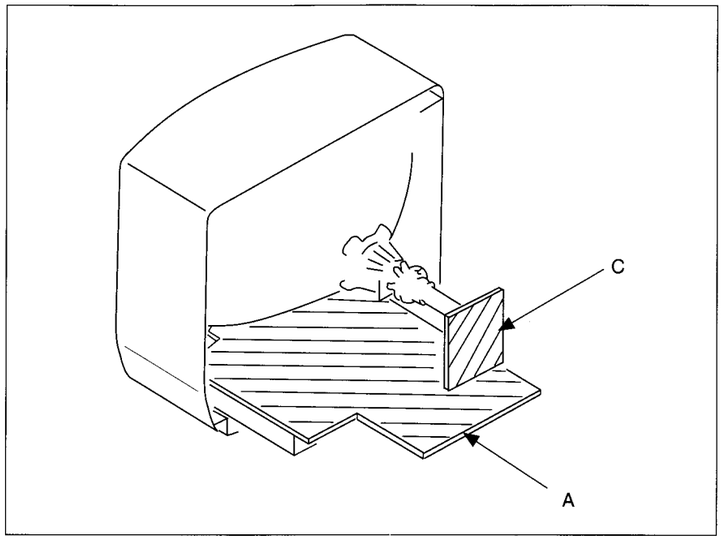
SECTION 5
DIAGRAMS

5-1. BLOCK DIAGRAM




J401
CNA81
R OUT
G OUT
B OUT
IFB
CNC71
R IN
G IN
B IN
FB
R-AMP/OUT Q703,706
G-AMP/OUT Q702,705
B-AMP/OUT Q701,704
R-A/C Q709
G-A/C Q708
B-A/C Q707
V901 PICTURE TUBE
H2
G2
G4
HV
CNC72
CNC73
RV703 SCRREN
RV704 FOCUS
C (RGB OUT)
VCENT
V-AMP Q500,501
IC501 VERTICAL OUTPUT
VOUT
VREF
VSS
IN V
VSOS
FB
OUT
HLC L806
CN804
H NOR
H BIG
H SMALL
CN801
HDY
VDY−
VDY+
DY
CN603
DGC
THP601
S601 POWER
F601 4A 250V
CN601
AC IN
LINE FILTER T601
AC RECT D610
T602 SRT
118V-RECT D606
+118V
H OUT-SW Q600
HOUT-CNT Q602
HOUT-SW Q803
H-DRIVE Q801
T801 HDT
H-OUT Q802
G2 RECT D804
CNA83
T802 FBT
CNA82
CN201
SPEAKER
J201
D601
D605
D602
D604
PS602
18V-RECT Q607
+18V
XRAY PORT
STBY
HP
IC601 SWITCHING REGULATOR
VIN
SENS
INH
DRIVE
SINK
IC603 +5V REG
DIS
RESET
VO1
VO2
+5V STBY
+5V
PS603
8V-RECT Q608
+8V
190V-RECT D802
+190V
24V-RECT D806
+24V
CN001
SCL
SDA
CS
AGC
SERVICE CONNECTOR

5-2. CIRCUIT BOARDS LOCATION



5-3. SCHEMATIC DIAGRAMS AND PRINTED WIRING BOARDS

Note :

- All capacitors are in µF unless otherwise noted. pF: µµF 50WV or less are not indicated except for electrolytic and tantalums.
- All resistors are in ohms. k = 1000 , M = 1000K
- Indication of resistance, which does not have one for rating electrical power, is as follows.

Pitch : 5 mm
Rating electrical power ¼ W

- : nonflammable resistor.
- : internal component.
- : panel designation, or adjustment for repair.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- : earth - ground.
- : earth - chassis.
- : no mounted.

Note : The components identified by shading and marked ⚠ are critical for safety. Replace only with the part number specified.

Note : Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite. Ne les remplacer que par une piece portant le numero specifie.

Reference information

RESISTOR	: RN	METAL FILM
	: RC	SOLID
	: FPRD	NONFLAMMABLE CARBON
	: FUSE	NONFLAMMABLE FUSIBLE
	: RS	NONFLAMMABLE METAL OXIDE
	: RB	NONFLAMMABLE CEMENT
	: RW	NONFLAMMABLE WIREWOUND
	:	ADJUSTABLE RESISTOR
COIL	: LF-8L	MICRO INDUCTOR
CAPACITOR	: TA	TANTALUM
	: PS	STYROL
	: PP	POLYPROPYLENE
	: PT	MYLAR
	: MPS	METALIZED POLYESTER
	: MPP	METALIZED POLYPROPYLENE
	: ALB	BIPOLAR
	: ALT	HIGH TEMPERATURE
	: ALR	HIGH RIPPLE

- Readings are taken with a colour-bar signal input.
- Readings are taken with 10M digital multimeter.
- Voltages are dc with respect to ground unless otherwise noted.
- Voltage variations may be noted due to normal production tolerances.
- All voltages are in V.
- Circled numbers are waveform references.
- : B+ bus.
- : signal path. (RF)

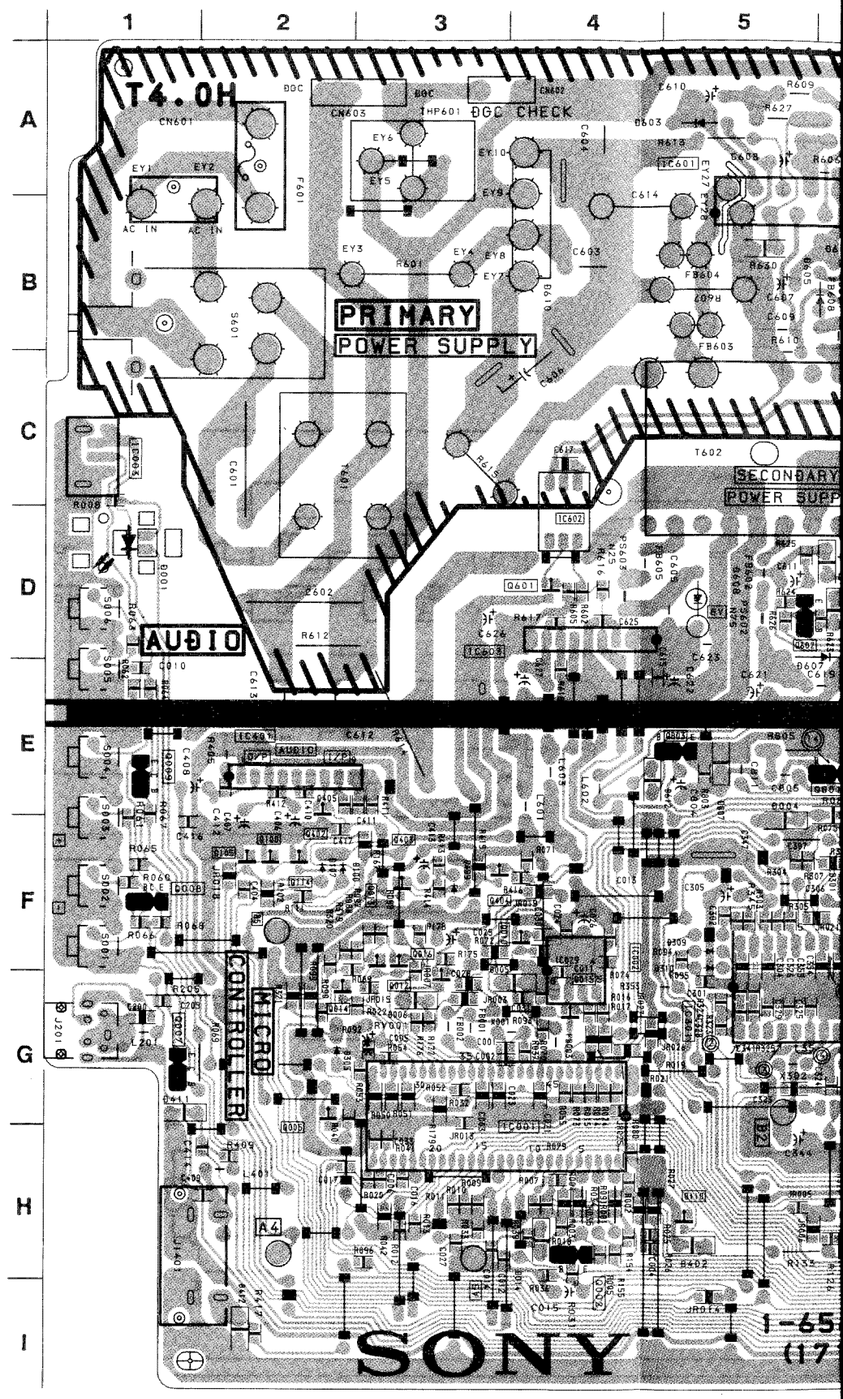
— A BOARD —

IC		TRANSISTOR				DIODE			
IC001	H-4	Q001	H-8	Q301	F-6	D001	D-1	D311	G-8
IC002	G-4	Q002	I-4	Q302	G-7	D002	F-8	D312	G-8
IC003	C-1	Q005	H-2	Q303	G-7	D004	F-5	D313	G-8
IC101	G-10	Q006	H-9	Q304	F-7	D005	G-4	D401	H-12
IC301	G-5	Q007	G-1	Q305	G-7	D014	I-4	D402	H-5
IC302	H-7	Q008	F-1	Q306	G-8	D100	F-3	D403	H-12
IC401	E-2	Q009	E-1	○ Q307	F-12	○ D102	G-11	D404	H-12
IC501	D-11	Q010	F-4	Q401	H-10	○ D104	G-11	D405	H-12
IC601	A-5	Q011	H-8	Q402	F-2	○ D105	F-8	D406	H-11
IC603	E-3	Q012	G-3	Q403	F-3	○ D106	F-8	D407	G-12
		Q013	F-3	Q404	F-4	D107	F-2	D408	I-12
		Q014	G-2	Q500	D-12	D109	F-9	D409	F-3
		Q015	G-4	Q501	E-12	D301	F-6	D410	I-11
		Q100	F-2	Q600	D-6	D302	F-7	D501	E-11
		○ Q101	G-11	Q602	D-5	D305	G-2	D600	D-6
		○ Q102	G-11	Q801	E-6	○ D307	G-11	D601	A-6
		○ Q103	G-11	Q802	D-8	○ D308	E-12	D602	B-6
		Q105	F-2	Q803	E-5	D309	F-5	D603	A-4
		Q107	H-9			D310	G-5	D604	B-6
		○ Q109	G-10					D605	B-6
		Q111	G-8					D606	D-6
		Q113	G-9					D607	E-6
		○ Q115	F-10					D608	D-5
		○ Q116	F-9					D610	B-4
		Q300	F-7					D611	D-6
								D612	E-5
								D802	C-7
								D804	D-8
								D806	A-7
								D807	E-5

○ Mark : M1440B, M1441B ONLY

A SYSTEM CONTROL, HORIZONTAL OUTPUT, VERTICAL OUTPUT, CHROMINANCE, POWER, AUDIO

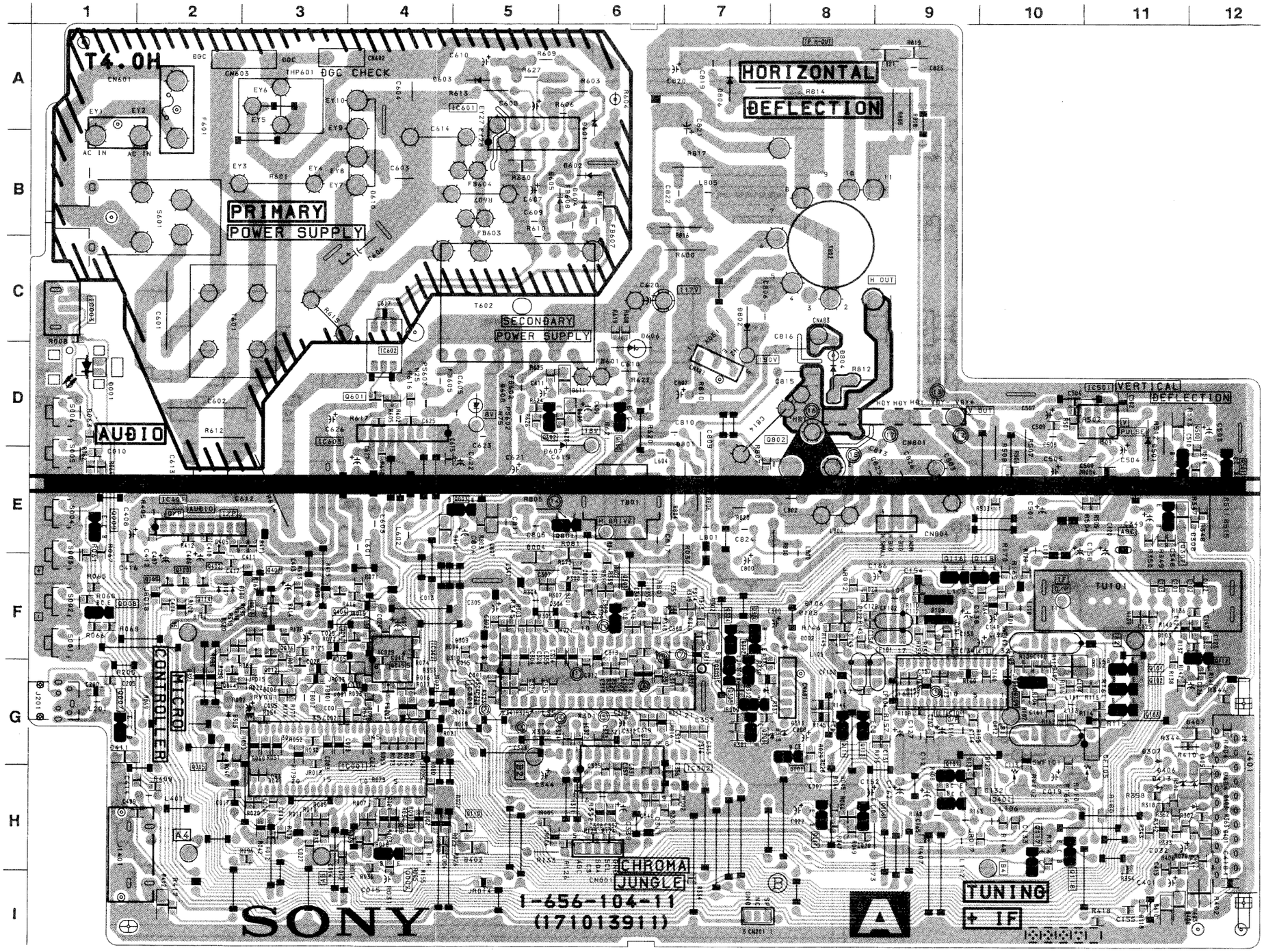
— A BOARD —



A SYSTEM CONTROL, HORIZONTAL OUTPUT, VERTICAL OUTPUT, CHROMINANCE, POWER, AUDIO

— A BOARD —

KV-M144 KV-M144



— A BOARD —

IC		TRANSISTOR				DIODE			
IC001	H-4	Q001	H-8	Q301	F-6	D001	D-1	D311	G-8
IC002	G-4	Q002	I-4	Q302	G-7	D002	F-8	D312	G-8
IC003	C-1	Q005	H-2	Q303	G-7	D004	F-5	D313	G-8
IC101	G-10	Q006	H-9	Q304	F-7	D005	G-4	D401	H-12
IC301	G-5	Q007	G-1	Q305	G-7	D014	I-4	D402	H-5
IC302	H-7	Q008	F-1	Q306	G-8	D100	F-3	D403	H-12
IC401	E-2	Q009	E-1	○ Q307	F-12	○ D102	G-11	D404	H-12
IC501	D-11	Q010	F-4	Q401	H-10	○ D104	G-11	D405	H-12
IC601	A-5	Q011	H-8	Q402	F-2	○ D105	F-8	D406	H-11
IC603	E-3	Q012	G-3	Q403	F-3	○ D106	F-8	D407	G-12
		Q013	F-3	Q404	F-4	D107	F-2	D408	I-12
		Q014	G-2	Q500	D-12	D109	F-9	D409	F-3
		Q015	G-4	Q501	E-12	D301	F-6	D410	I-11
		Q100	F-2	Q600	D-6	D302	F-7	D501	E-11
		○ Q101	G-11	Q602	D-5	D305	G-2	D600	D-6
		○ Q102	G-11	Q801	E-6	○ D307	G-11	D601	A-6
		○ Q103	G-11	Q802	D-8	○ D308	E-12	D602	B-6
		Q105	F-2	Q803	E-5	D309	F-5	D603	A-4
		Q107	H-9			D310	G-5	D604	B-6
		○ Q109	G-10					D605	B-6
		Q111	G-8					D606	D-6
		Q113	G-9					D607	E-6
		○ Q115	F-10					D608	D-5
		○ Q116	F-9					D610	B-4
		Q300	F-7					D611	D-6
								D612	E-5
								D802	C-7
								D804	D-8
								D806	A-7
								D807	E-5

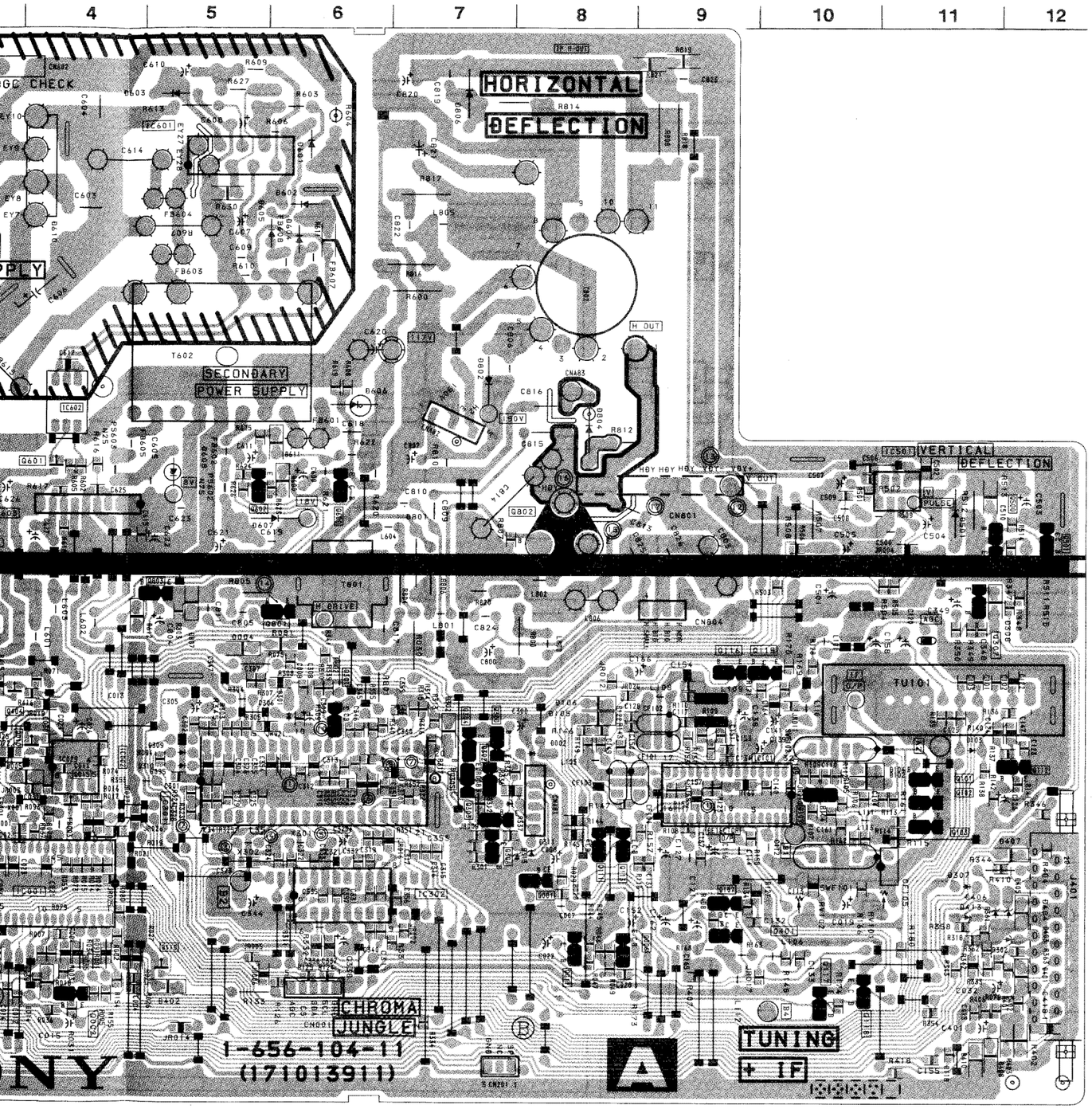
○ Mark : M1440B, M1441B ONLY

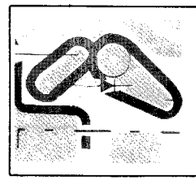
A BOARD

Ref. No. \ Model	
CN602	
C131	
CF101	
CF102	
CF103	
CF104	
D105	
D106	
IC001	
IC101	
IC301	
L108	
Q111	
Q113	
R122	
R134	
R143	
R144	
R145	
R147	
R149	
R158	
R161	
R180	
R410	
SWF101	
TU101	

Ref. No. \ Model	
CN602	
C131	
CF101	
CF102	
CF103	
CF104	
D105	
D106	
IC001	
IC101	
IC301	
L108	
Q111	
Q113	
R122	
R134	
R143	
R144	
R145	
R147	
R149	
R158	
R161	
R180	
R410	
SWF101	
TU101	

UTPUT,



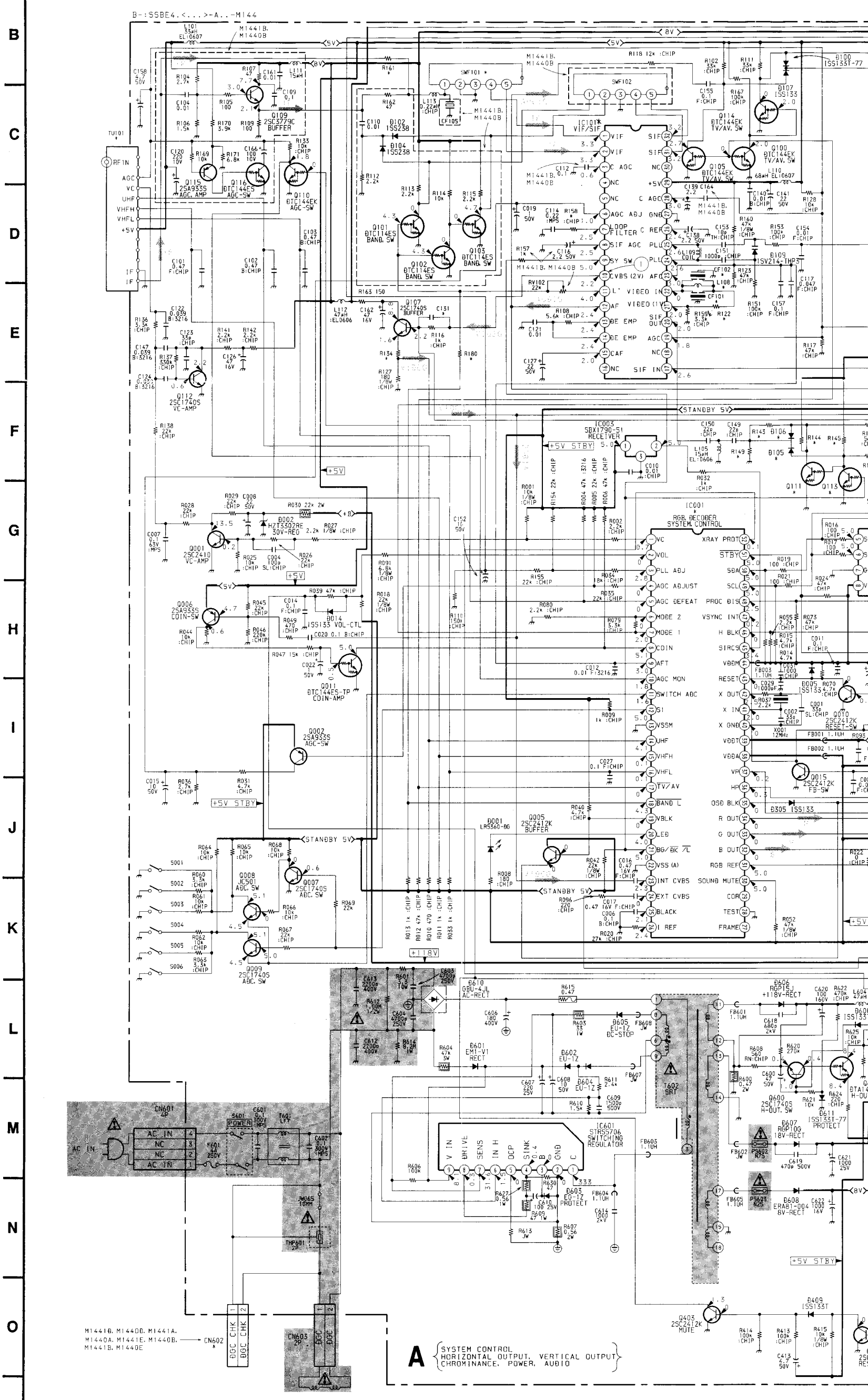


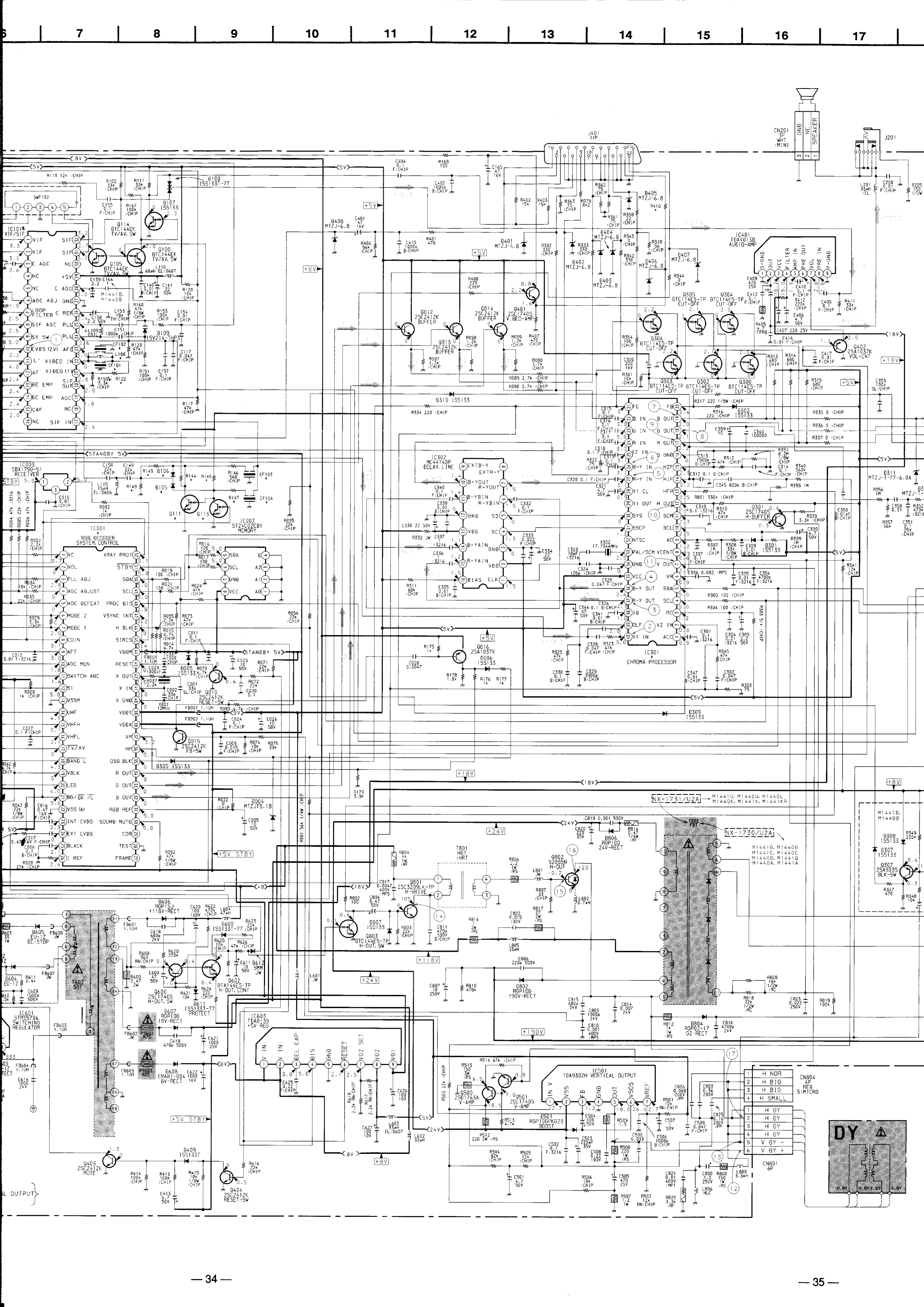
NOTE:
The circuit indicated as left contains high voltage of over 600 Vp-p. Care must be paid to prevent an electric shock in inspection or repairing.

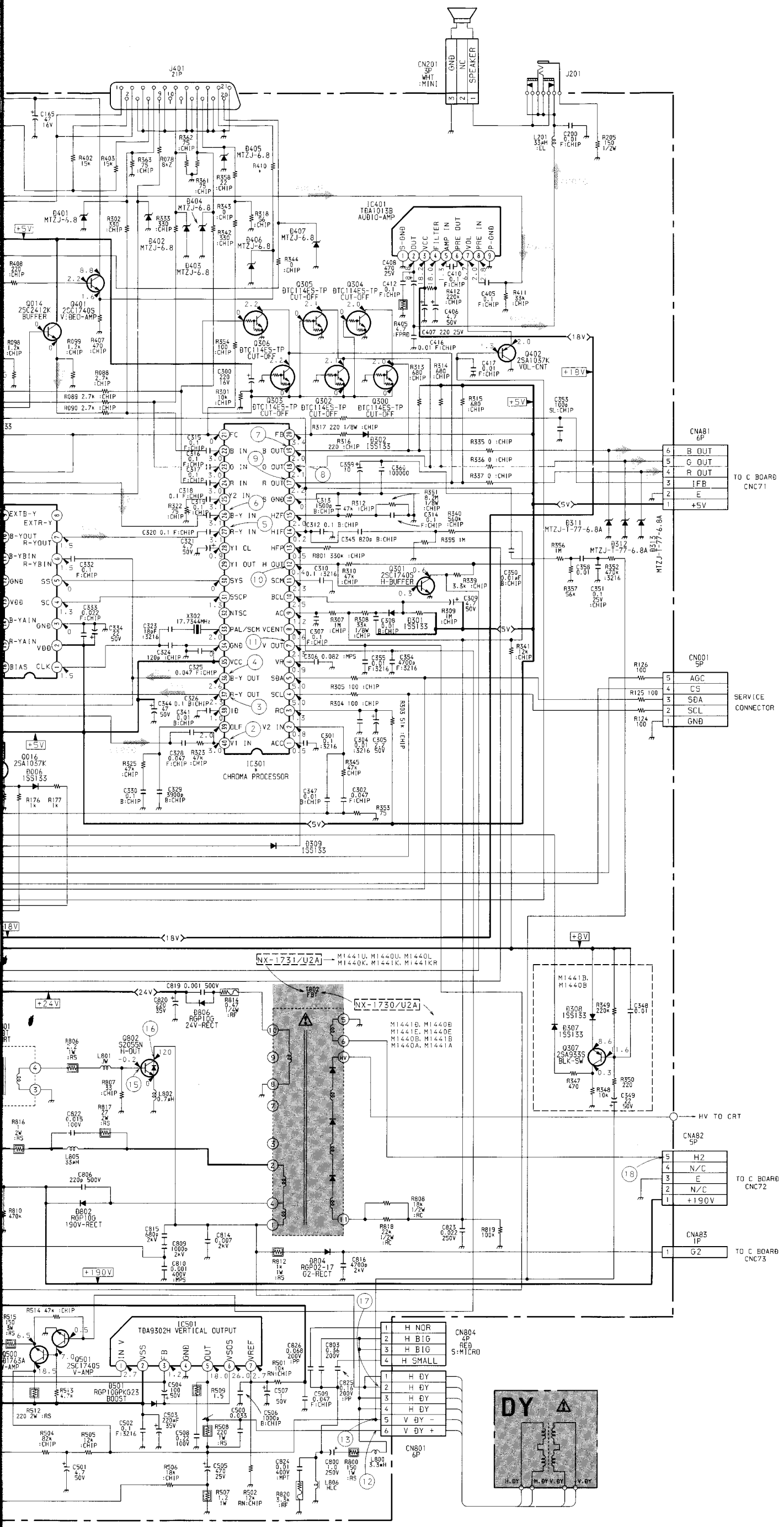
A BOARD * MARK

Model / Ref. No.	M1440A	M1441A	M1440B	M1441B	M1440D	M1441D	M1440E
CN602	2P	2P	2P	2P	2P	2P	2P
C131	–	–	–	–	–	–	–
CF101	5.5 / 5.74 MHz	5.5 / 5.74 MHz	5.5 / 6.5 MHz	5.5 / 6.5 MHz	5.5 / 5.74 MHz	5.5 / 5.74 MHz	5.5 / 5.74 MHz
CF102	–	–	–	–	–	–	–
CF103	5.5 MHz	5.5 MHz	5.5 MHz	5.5 MHz	5.5 MHz	5.5 MHz	5.5 MHz
CF104	–	–	–	–	–	–	–
D105	–	–	–	–	–	–	–
D106	–	–	–	–	–	–	–
IC001	SAA5288ZP/007	SAA5290ZP/007	SAA5288ZP/007	SAA5290ZP/007	SAA5288ZP/007	SAA5290ZP/007	SAA5288ZP/007
IC101	TDA9806	TDA9806	TDA9806	TDA9812	TDA9806	TDA9806	TDA9806
IC301	MC44007P	MC44007P	MC44002P	MC44002P	MC44002P	MC44002P	MC44007P
L108	8.2 UH	8.2 UH	8.2 UH	8.2 UH	8.2 UH	8.2 UH	8.2 UH
Q111	–	–	–	–	–	–	–
Q113	–	–	–	–	–	–	–
R122	150	150	150	150	150	150	150
R134	180	180	180	180	180	180	180
R143	0	0	0	0	0	0	0
R144	–	–	–	–	–	–	–
R145	–	–	–	–	–	–	–
R147	–	–	–	–	–	–	–
R149	–	–	–	–	–	–	–
R158	–	–	180	180	–	–	–
R161	0	0	–	–	0	0	0
R180	–	–	1K	1K	–	–	–
R410	75	75	75	75	75	75	75
SWF101	OPWG1963	OPWG1963	OFWK3953	OFWK3953	OPWG1963	OPWG1963	OPWG1963
TU101	TELE1X001A	TELE1X001A	BT-AC401	BT-AC401	BT-AC401	BT-AC401	BT-AC401

Model / Ref. No.	M1441E	M1440K	M1441K	M1441KR	M1440L	M1440U	M1441U
CN602	2P	–	–	–	–	–	–
C131	–	0.001	0.001	0.001	–	–	–
CF101	5.5 / 5.74 MHz	5.5 / 5.74 MHz	5.5 / 5.74 MHz	5.5 / 5.74 MHz	6.0 / 6.5 MHz	6.0 / 6.5 MHz	6.0 / 6.5 MHz
CF102	–	6.5 MHz	6.5 MHz	6.5 MHz	–	–	–
CF103	5.5 MHz	5.5 MHz	5.5 MHz	5.5 MHz	6.0 MHz	6.0 MHz	6.0 MHz
CF104	–	6.5 MHz	6.5 MHz	6.5 MHz	–	–	–
D105	–	1SS133T	1SS133T	1SS133T	–	–	–
D106	–	1SS133T	1SS133T	1SS133T	–	–	–
IC001	SAA5290ZP/007	SAA5288ZP/007	SAA5290ZP/007	SAA5290ZP/006	SAA5288ZP/005	SAA5288ZP/005	SAA5290ZP/005
IC101	TDA9806	TDA9806	TDA9806	TDA9806	TDA9806	TDA9806	TDA9806
IC301	MC44007P	MC44002P	MC44002P	MC44002P	MC44007P	MC44007P	MC44007P
L108	8.2 UH	4.7 UH	4.7 UH	4.7 UH	8.2 UH	8.2 UH	8.2 UH
Q111	–	DTC144ES	DTC144ES	DTC144ES	–	–	–
Q113	–	DTC144ES	DTC144ES	DTC144ES	–	–	–
R122	150	100	100	100	150	150	150
R134	180	180	180	180	150	150	150
R143	0	–	–	–	0	0	0
R144	–	2.2 K	2.2 K	2.2 K	–	–	–
R145	–	2.2 K	2.2 K	2.2 K	–	–	–
R147	–	–	560	560	–	–	–
R149	–	2.2 K	2.2 K	2.2 K	–	–	–
R158	–	–	–	–	–	–	–
R161	0	0	0	0	0	0	0
R180	–	–	–	–	–	–	–
R410	75	75	75	75	68	68	68
SWF101	OPWG1963	OFWK2950	OFWK2950	OFWK2950	OFWJ1952M	OFWJ1952M	OFWJ1952M
TU101	BT-AC401	UV1315	UV1315	TELE1X001A	UV1315	BT-AU601	BT-AU601


B-:SSBE4.<...>-A..-M144
A
SYSTEM CONTROL
HORIZONTAL OUTPUT, VERTICAL OUTPUT
CHROMINANCE, POWER, AUDIO
M1441B. M1440B. M1441A.
M1440A. M1441E. M1440B.
M1441B. M1440E
CN602
IC001
RGB DECODER
SYSTEM CONTROL
IC101*
VIF/SIF
IC003
SBX1790-51
RECEIVER
IC401
STR5706
SWITCHING
REGULATOR
Q109
2SC3779C
BUFFER
Q107
2SC1740S
BUFFER
Q005
2SC2412K
BUFFER
Q001
2SC2410
VC-AMP
Q112
2SC1740S
VC-AMP
Q009
2SC1740S
AGC SW
Q008
JC501
AGC SW
Q007
2SC1740S
AGC SW
Q006
2SA933S
COIN-SW
Q011
BTC144ES-TP
COIN-AMP
Q002
2SA933S
AGC-SW
Q115
2SA933S
AGC AMP
Q116
BTC144ES
AGC-SW
Q110
BTC144EK
AGC-SW
Q101
BTC114ES
BAND SW
Q102
BTC114ES
BAND SW
Q103
BTC114ES
BAND SW
Q114
BTC144EK
TV/AV SW
Q105
BTC144EK
TV/AV SW
Q104
BTC144EK
TV/AV SW
Q100
BTC144EK
TV/AV SW
Q107
2SC1740S
H-OUT SW
Q015
2SC2412K
FB-SW
Q070
2SC2412K
RESET-SW
Q403
2SC2412K
MUTE
Q111
Q113
D100
1SS133T-77
D107
1SS133
D106
RGP15J
+118V-RECT
D607
RGP10G
18V-RECT
D608
ERA81-004
8V-RECT
D609
1SS133T
PROTECT
D610
GBU-4JL
AC-RECT
D605
EU-1Z
DC-STOP
D602
EU-1Z
D603
EG-1Z
PROTECT
D604
EU-1Z
D601
EM1-V1
RECT
D102
1SS238
D104
1SS238
D014
1SS133
VOL-CTL
D001
LR5360-DG
D305
1SS133
D409
1SS133T
D611
1SS133T-77
PROTECT
D005
1SS133
D106
D105
D109
1SV214-TH3
D108
D111
D112
D113
D114
D115
D116
D117
D118
D119
D120
D121
D122
D123
D124
D125
D126
D127
D128
D129
D130
D131
D132
D133
D134
D135
D136
D137
D138
D139
D140
D141
D142
D143
D144
D145
D146
D147
D148
D149
D150

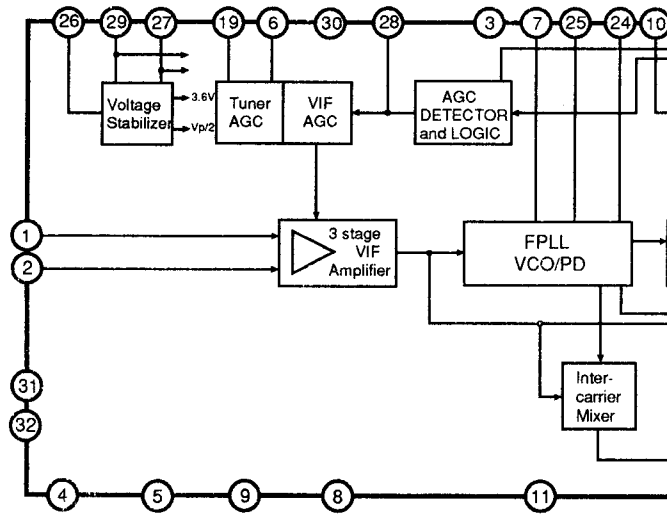

IC001 RGB DECODER SYSTEM CONTROL
IC002 ST24C02CBI MEMORY
IC003 SBX1790-51 RECEIVER
IC101 VIF/SIF
IC301 CHROMA PROCESSOR
IC302 MC44140P DELAY LINE
IC401 TDA1013B AUDIO-AMP
IC501 TDA9302H VERTICAL OUTPUT
IC601 STRS5706 SWITCHING REGULATOR
IC603 TDA8139 +5V REG
J401 21P
J201
CN201 3P WHT :MINI
CN801 6P
CN804 4P RED S:MICRO
SWF102
X001 12MHz
X302 17.7344MHz
T801 HOT :HRT
T802 SRT
L110 68uH EL:0607
L105 15uH EL:0606
L201 33mH :EL
L601 JW
L602 33uH EL:0607
L603 33uH EL:0607
L604 47uH
L801 JW
L802 0.7uH
L805 33uH
Q100 DTC144EK TV/AV. SW
Q105 DTC144EK TV/AV. SW
Q114 DTC144EK TV/AV. SW
Q012 2SC2412K BUFFER
Q013 2SC2412K BUFFER
Q014 2SC2412K BUFFER
Q401 2SC1740S V.DEO-AMP
Q015 2SC2412K FB-SW
Q016 2SA1037K
Q403 2SC2412K MUTE
Q404 2SC2412K RESET-SW
Q600 2SD1740S H-OUT. SW
Q602 DTA144ES-TP H-OUT. CONT
Q803 DTC144ES-TP H-OUT. SW
Q801 2SC3209LK-TP H-DRIVE
Q802 S2055N H-OUT
Q300 DTC114ES-TP CUT-OFF
Q302 DTC114ES-TP CUT-OFF
Q303 DTC114ES-TP CUT-OFF
Q304 DTC114ES-TP CUT-OFF
Q305 DTC114ES-TP CUT-OFF
Q306 DTC114ES-TP CUT-OFF
Q402 2SA1037K VOL-CNT
Q500 2SD1763A V-AMP
Q501 2SC1740S V-AMP
Q301 2SC1740S H-BUFFER
Q303 2SA933S BLK-SW
D001 1SS133T-77
D002 MTZJT5.1B
D003 1SS133T-77 PROTECT
D004 MTZJT5.1B
D005 1SS133
D006 1SS133
D007 RGP10G 18V-RECT
D008 ERA81-004 8V-RECT
D009 1SV214-TH-P5
D100 1SS133T-77
D107 1SS133
D305 1SS133
D309 1SS133
D310 1SS133
D311 MTZJ-T-77-6.8A
D400 MTZJ-6.8
D401 MTZJ-6.8
D402 MTZJ-6.8
D403 MTZJ-6.8
D404 MTZJ-6.8
D405 MTZJ-6.8
D406 MTZJ-6.8
D407 MTZJ-6.8
D408 MTZJ-6.8
D600 1SS133T-77
D602 5MM JW
D605 EU-1Z DC-STOP
D606 RGP15J +118V-RECT
D607 RGP10G 190V-RECT
D608 JW
D609 1SS133T
D611 1SS133T-77 PROTECT
D612 5MM JW
D801 1SS133
D802 RGP10G 190V-RECT
D804 RGP02-17 G2-RECT
D806 RGP10G 24V-RECT
D807 1SS133
D808 RGP10G 24V-RECT
D0307 2SA933S BLK-SW
D0308 1SS133
D0311 MTZJ-T-77-6.8A
PS601 N25
PS602 N25
PS603 N25
NX-1731/U2A → M1441U, M1440U, M1440L, M1440K, M1441K, M1441KR
NX-1730/U2A → M1441B, M1440B, M1441E, M1440E, M1441B, M1440B, M1441A, M1440A
DY
H NOR
H BIG
H BIG
H SMALL
H ΦY
H ΦY
H ΦY
H ΦY
V ΦY -
V ΦY +
8V
5V
+5V
+8V
18V
+18V
24V
+24V
+5V STBY
STANDBY 5V
+118V
+190V
+B



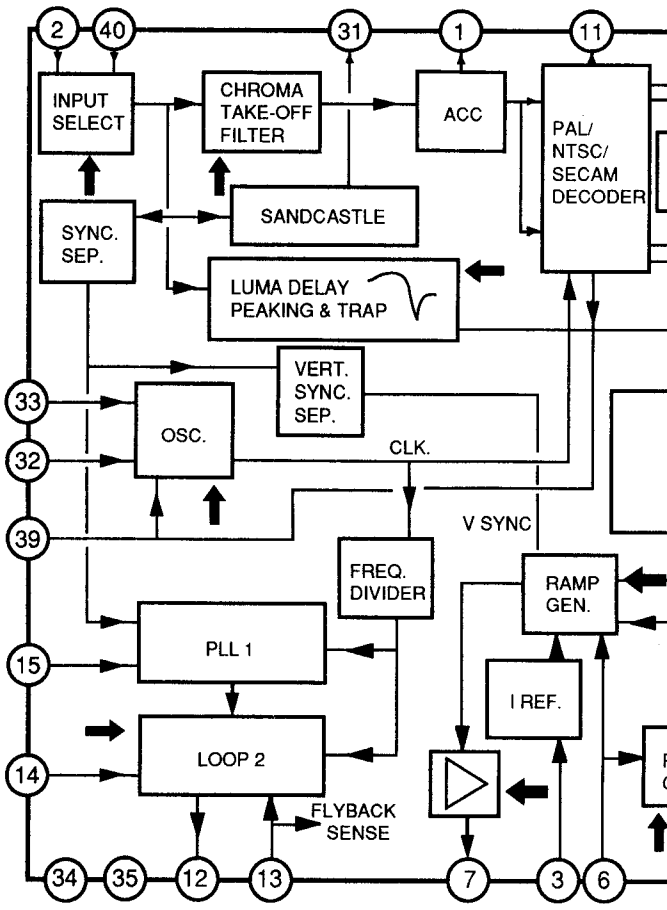
WAVEFORMS A BOARD

① 2.0 Vp-p (H)	② 1.0 Vp-p (H)	③ 1.0
⑤ PAL 1.0 Vp-p (H)	⑤ SECAM 0.5 Vp-p (H)	⑤ 1.1
⑥ NTSC 1.5 Vp-p (H)	⑦ 1.0 Vp-p (H)	⑧ 1.4
⑪ 1.8 Vp-p (V)	⑫ 55 Vp-p (V)	⑬ 7.3
⑯ 1.4KVp-p (H)	⑰ 51 Vp-p (H)	⑱ 24

A BOARD IC101 TDA9806/TDA9812



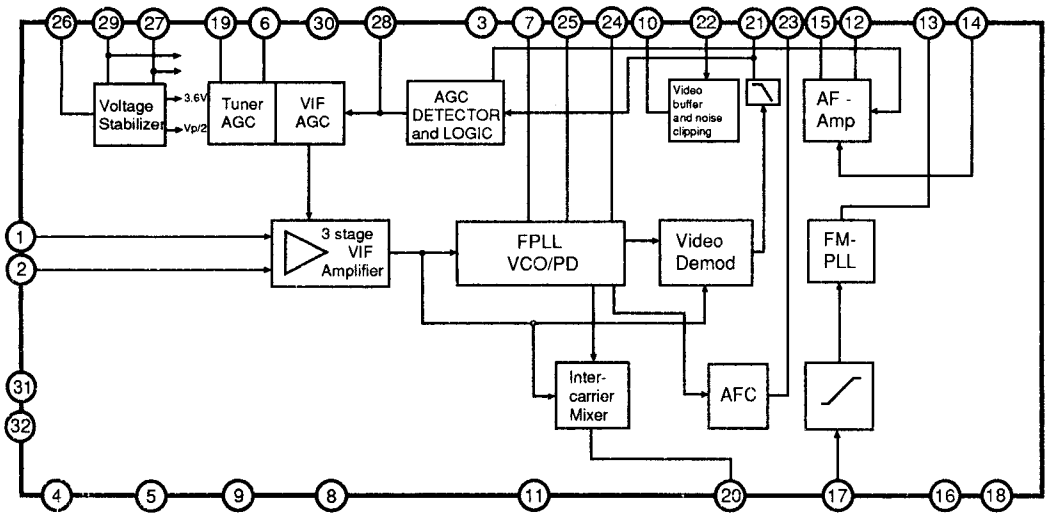
A BOARD IC301 MC4402P/MC44007P



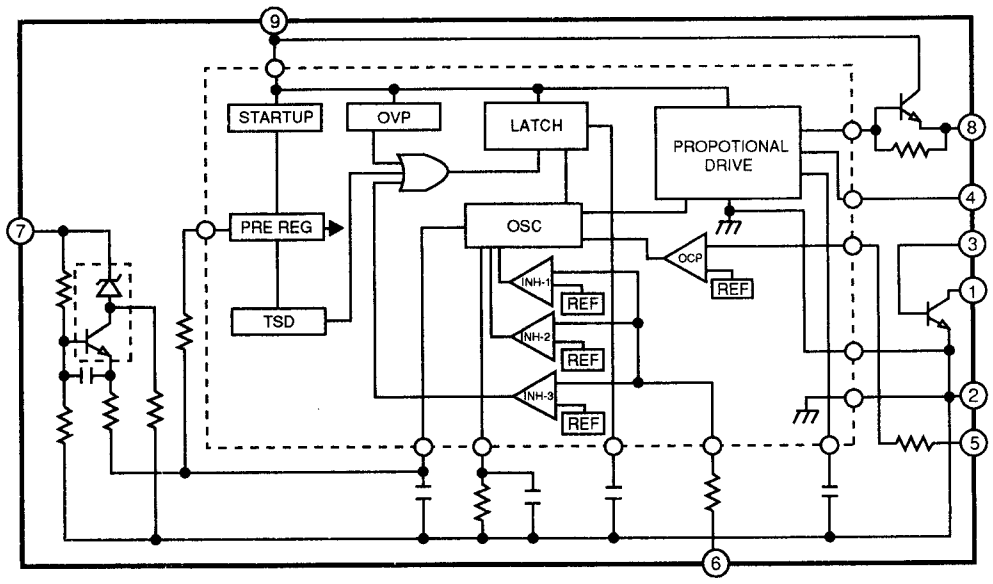
WAVEFORMS A BOARD

① 2.0 Vp-p (H)	② 1.0 Vp-p (H)	③ 1.0 Vp-p (H)	④ PAL 1.0 Vp-p (H)	④ SECAM/NTSC 1.2 Vp-p (H)
⑤ PAL 1.0 Vp-p (H)	⑤ SECAM 0.5 Vp-p (H)	⑤ NTSC 1.1 Vp-p (H)	⑥ PAL 1.4 Vp-p (H)	⑥ SECAM 0.7 Vp-p (H)
⑥ NTSC 1.5 Vp-p (H)	⑦ 1.0 Vp-p (H)	⑧ 1.4 Vp-p (H)	⑨ 1.5 Vp-p (H)	⑩ 0.8 Vp-p (H)
⑪ 1.8 Vp-p (V)	⑫ 55 Vp-p (V)	⑬ 7.3 Vp-p (V)	⑭ 220 Vp-p (H)	⑮ 10 Vp-p (H)
⑯ 1.4KVp-p (H)	⑰ 51 Vp-p (H)	⑱ 24 Vp-p (H)		

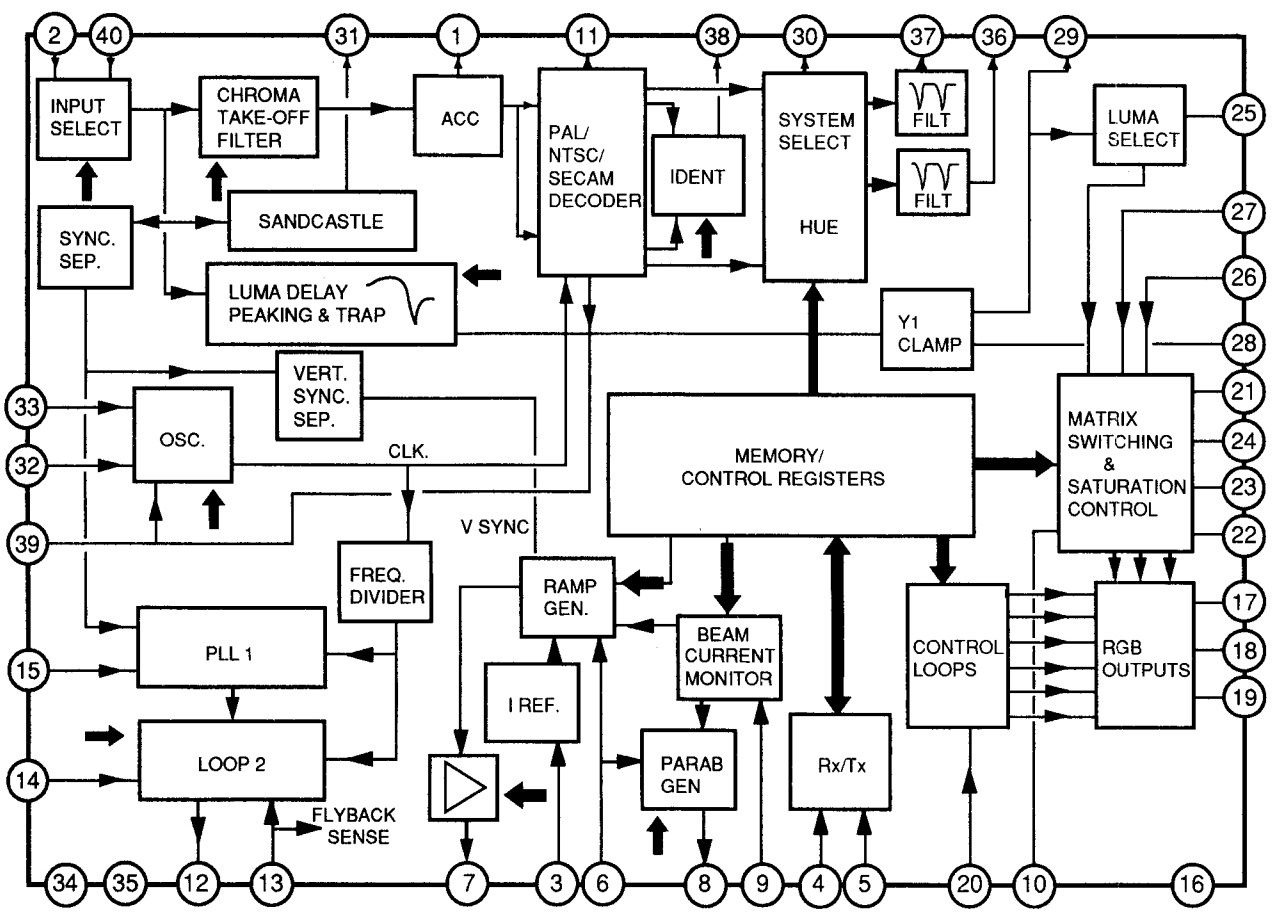
A BOARD IC101 TDA9806/TDA9812



A BOARD IC601 STRS5706

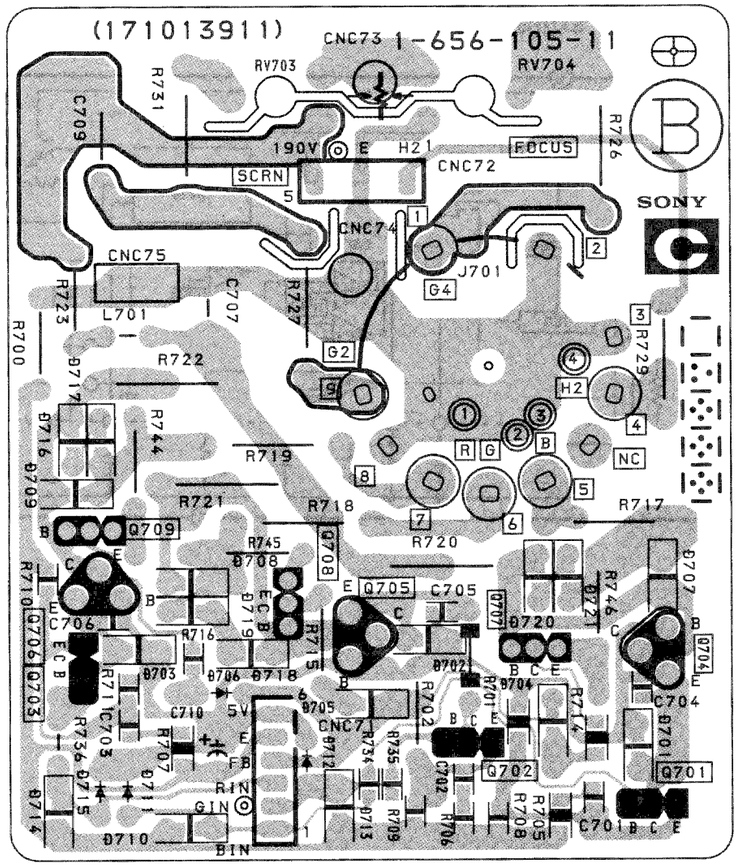


A BOARD IC301 MC4402P/MC44007P



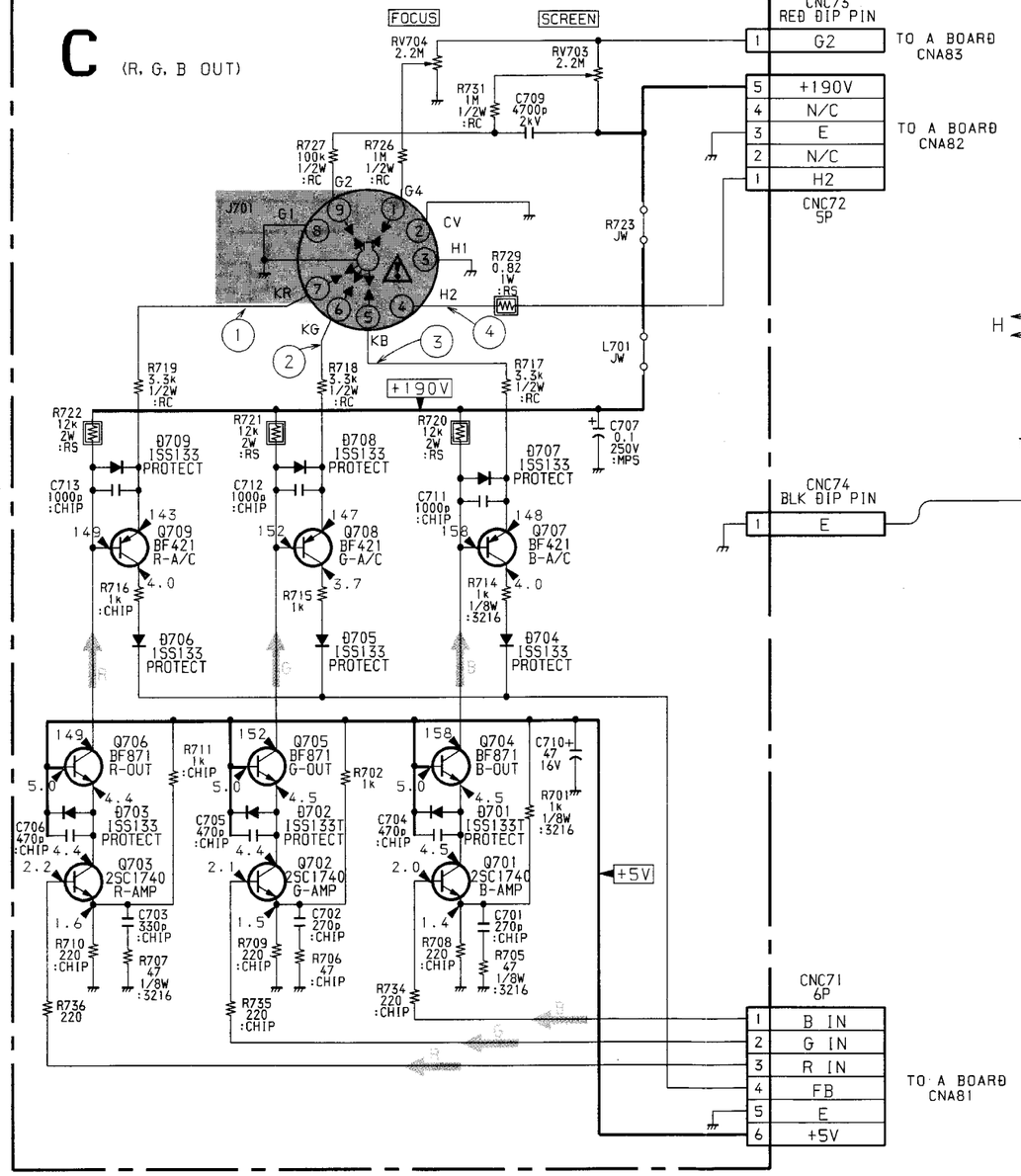
C [R.G.B OUT]

— C BOARD —

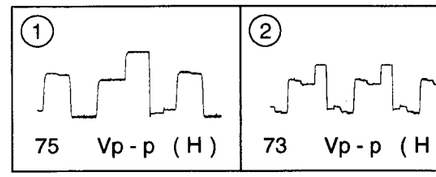


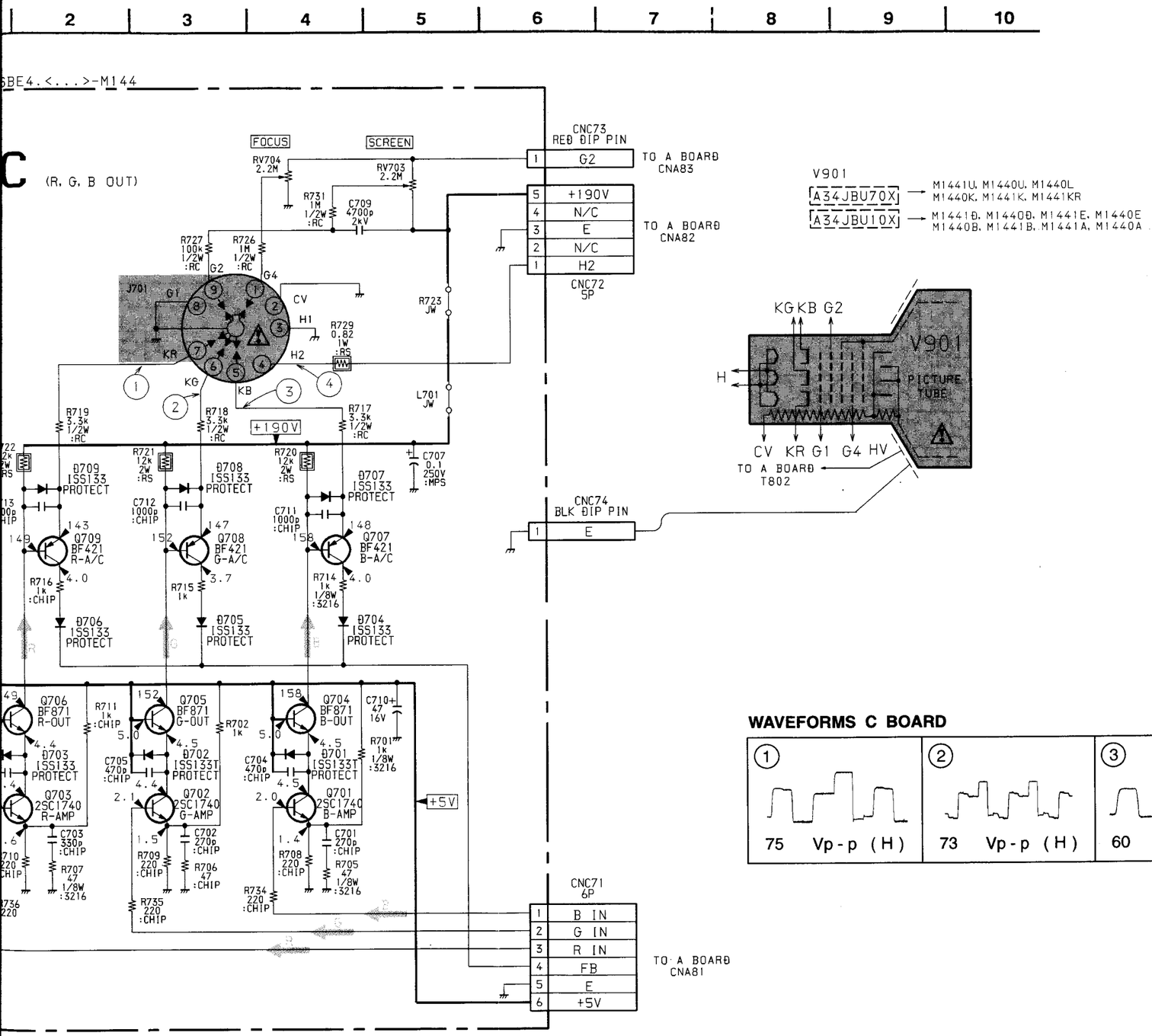
B-:SSBE4.<...>-M144

C (R, G, B OUT)



WAVEFORMS C BOARD



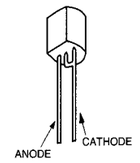


WAVEFORMS C BOARD

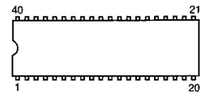
①	②	③	④
75 Vp-p (H)	73 Vp-p (H)	60 Vp-p (H)	22 Vp-p (H)

5-4. SEMICONDUCTORS

HZT33-02RE
UPC574J

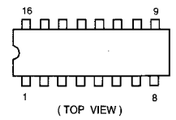


MC44002P
MC44007P



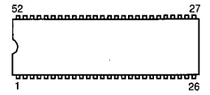
(TOP VIEW)

MC44140P



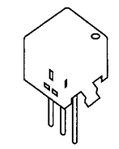
(TOP VIEW)

SAA5288ZP/005
SAA5288ZP/007
SAA5290ZP/005
SAA5290ZP/006
SAA5290ZP/007

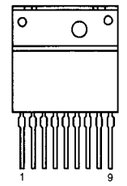


(TOP VIEW)

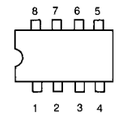
SBX1790-11
SBX1790-51



STR-S5706

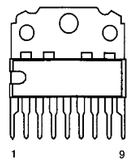


ST24C02CB1

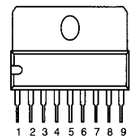


(TOP VIEW)

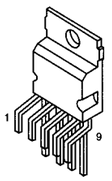
TDA1013B



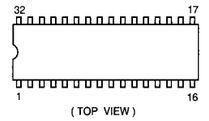
TDA8139



TDA9302H

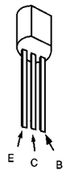


TDA9806
TDA9812

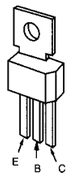


(TOP VIEW)

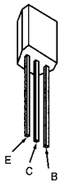
BF421
2SA1091-0



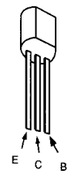
BF871



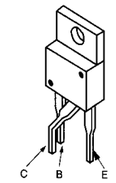
DTA144ES
DTC114ES
DTC144ES



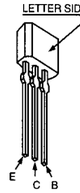
JA101-Q
JC501-Q
2SA733-K
2SC2785-HFE



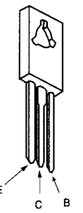
S2055N-16E31



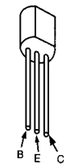
2SA993S
2SA1175-HFE



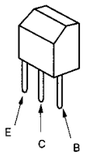
2SC2688-L



2SC3779C

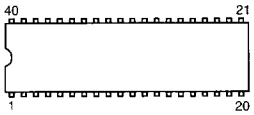


2SD774



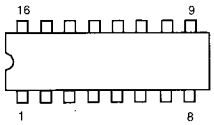
5-4. SEMICONDUCTORS

MC44002P
MC44007P



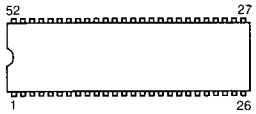
(TOP VIEW)

MC44140P



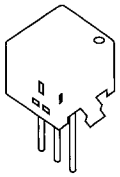
(TOP VIEW)

SAA5288ZP/014
SAA5290ZP/014
SAA5290ZP/015

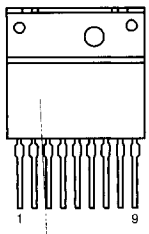


(TOP VIEW)

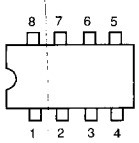
SBX1790-51



STR-S5706

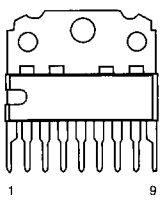


ST24C02CB1

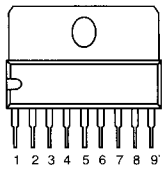


(TOP VIEW)

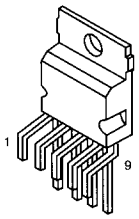
TDA1013B



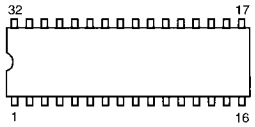
TDA8139



TDA9302H

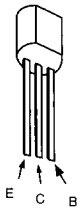


TDA9806
TDA9812

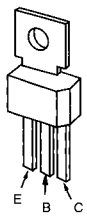


(TOP VIEW)

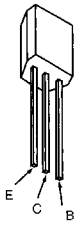
BF421-AMMO
2SA1091-0



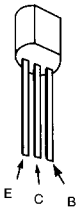
BF871-127



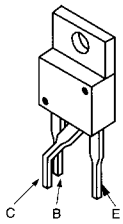
DTA144ES
DTC114EK
DTC144EK
DTC144ES



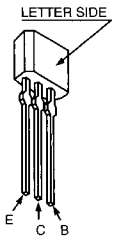
2SA933AS-QRT
2SA933S-RT
2SC2785-HFE



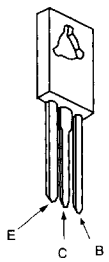
S2055N-16E314A



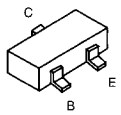
2SA993S
2SA1175-HFE
2SC1740S-RT
2SC2410S-N



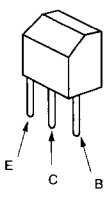
2SC774-34
2SC1162-G
2SC2688-LK



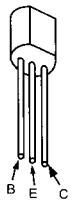
2SC2412K-QR



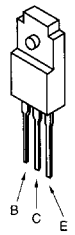
2SC3209LK-TP



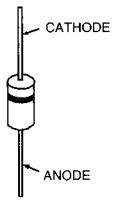
2SC3779C



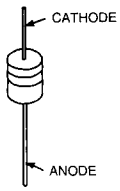
2SC4793
2SD1763A



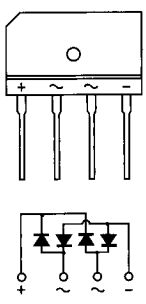
EG-1Z-V1 RGP02-17EL-6433
EGP20G RGP02-17PKG23
EL1Z RGP10-GPKG23
EM1-V1 1SS168
EU-1Z 1SS292T-77



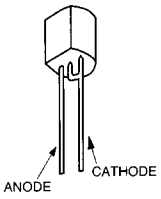
ERA81-004TP1
MTZJ-T-77-5.1B
MTZJ-T-77-6.8A
RD5.1ES-B2
RD6.8ES-B2
1SS133T-77



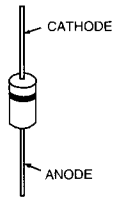
GBU4JL-6088



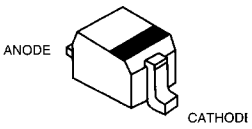
HZT33-02RE
UPC574J



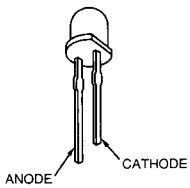
RGP15J-6040



1SV214-TPH3



LS5360H



6-1. CHASSIS AND PICTURE TUBE

■ : +BVTP SCREW 4x16 7-685-663-79

